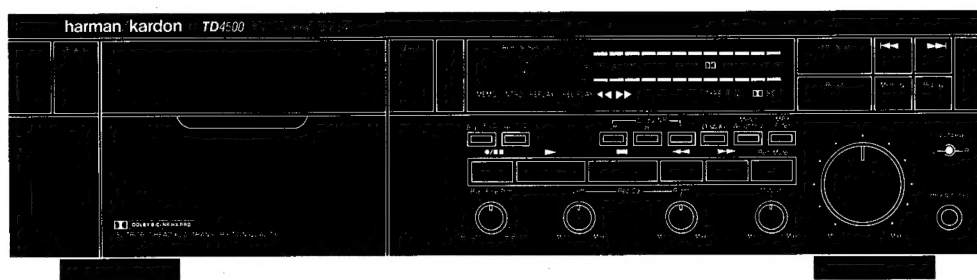


# The Harman Kardon Model TD4500

Manual 163A

## CD TRANSCRIPTION QUALITY CASSETTE DECK

# Technical Manual



The following marks found in the parts list of this manual identify the models as follows.

- UA :North America area model
- BK :North America area Black version
- I :International model
- IB :International model Black version

**harman/kardon**

240 Crossways Park West, Woodbury, N.Y. 11797  
1112-3152163A6 P-119010 2000 Printed in Japan

TD4500

## SPECIFICATIONS

Track Configuration	Nominal 4-track 2 Channel Stereo Cassette Deck	Limit	Nominal 45dB 70dB	Limit ≥ 35dB ≥ 60dB
<b>• MECHANICAL SECTION</b>				
Record/Playback Tape Speed				
Drift 4.75cm/sec.	0.2% ±2.0%			
Wow and Flutter	0.045%(NAB) ≤ 0.1%			
	0.07%(CCIR)			
Take Up Torque	50gr.cm	35~70gr.cm		
Back Tension	4gr.cm	2~6gr.cm		
F.FWD Torque	100gr.cm	70~150gr.cm		
REW Torque	100gr.cm	70~150gr.cm		
F.FWD/REW Time (C-60 Tape)	90sec.	≤ 100sec.		
<b>• AMPLIFIER SECTION</b>				
Bias Frequency	105kHz ± 5kHz			
Playback Output	1150mV ± 1.5dB			
Signal-to-Noise Ratio at Line Input (Input 1kHz, 100mV)				
IHF-A WTD at Dolby Level Dolby NR off				
	LN	51dB		
	CrO <sub>2</sub>	54dB		
	Metal	54dB		
Dolby B NR				
	LN	61dB		
	CrO <sub>2</sub>	64dB	≥ 60dB	
	Metal	64dB	≥ 60dB	
Dolby C NR				
	LN	66dB		
	CrO <sub>2</sub>	70dB	≥ 66dB	
	Metal	70dB	≥ 66dB	
Channel Separation				
Crosstalk				
Record/Playback Distortion (Input 1kHz)				
	LN	0.9%	≤ 2.0%	
	CrO <sub>2</sub>	1.5%	≤ 3.0%	
	Metal	1.3%	≤ 2.0%	
MPX Filter Attenuation				
	at 15kHz	0.3dB	≤ 1dB	
	at 19kHz	35dB	≥ 30dB	
Erase Ratio (Input 80Hz)				
	LN	70dB	≥ 60dB	
	Metal	61dB	≥ 56dB	
Input Sensitivity (Input 1kHz) at Line Input	45mV	40(min)~100(max)mV		
Input Impedance (Input 1kHz) at Line Input	22kΩ	19(min)~30(max)kΩ		
<b>• DIMENSIONS(WxHxD)</b>				
			17-3/8" x 5" x 12-5/8"	
			(442 x 126 x 320 mm)	
<b>• WEIGHT</b>				
			13.4lbs(6.1kg)	
<b>• POWER SUPPLY</b>				
U.S.A. and Canada models	AC120V, 60Hz			
International model	AC220V/240V, 50/60Hz			
<b>• POWER CONSUMPTION</b>				
U.S.A. and Canada models	28W			
International model	30W			

These specifications are service target specs.  
Specifications and components are subject to change without notice.  
Overall performance will be maintained or improved.

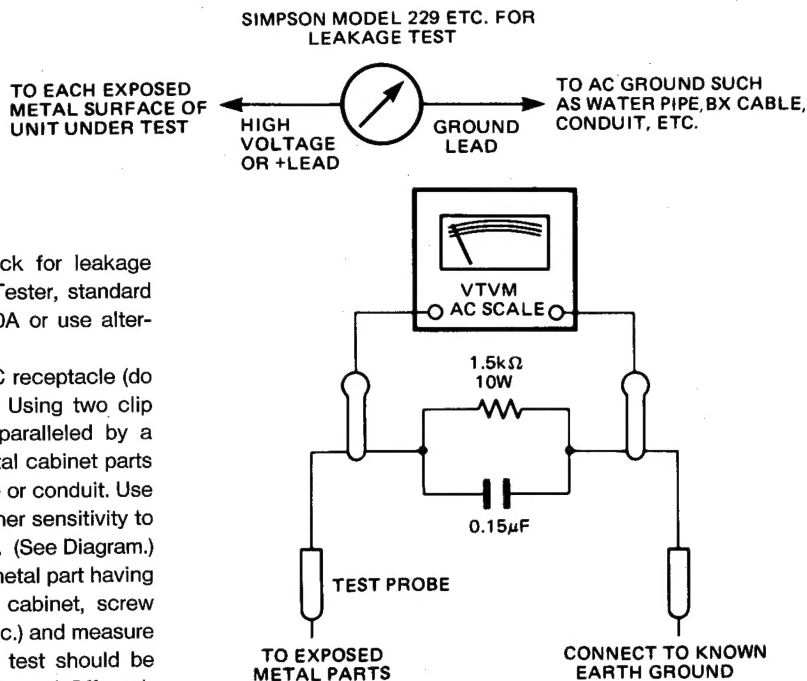
## LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)

Before returning the unit to the user, perform the following safety checks:

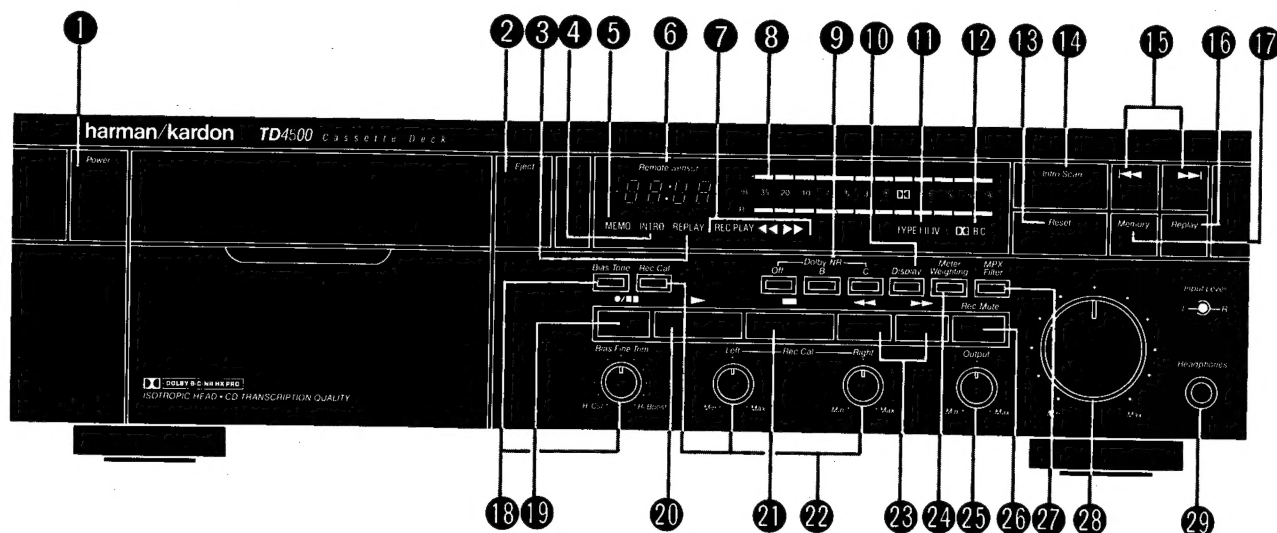
1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Replace all protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, or shields, isolation resistor/capacitor networks, mechanical insulators, etc.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No.21641, RCA Model WT540A or use alternate method as follows:

Plug the AC line cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 ohm, 10-watt resistor paralleled by a 0.15μF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)

A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.



## CONTROLS AND FUNCTIONS

**1 POWER SWITCH**

Press to turn unit on or off.

**2 EJECT**

Press to load or remove tape cassette.

**3 REPLAY**

Indicates Replay is engaged.

**4 INTRO**

Indicates Intro Scan is engaged.

**5 MEMO**

Indicates Memory is engaged.

**6 COUNTER**

Indicates tape position in minutes and seconds.

**7 REC PLAY ◀▶**

Displays operating mode: Record, Play, Rewind or Fast Forward.

**8 LEVEL METER**

Shows signal level.

**9 DOLBY\*NR**

**OFF**

Press to play or record without Dolby Noise Reduction.

**B**

Press to play or record using Dolby B NR.

**C**

Press to play or record using Dolby C NR.

**10 DISPLAY**

Press to turn display panel on or off.

**11 TYPE I II IV**

Automatically indicates type of tape in use.

**12 DOLBY B C NR**

Shows if Dolby B or C NR circuits are on.

**13 RESET**

Resets Counter to 00:00.

**14 INTRO SCAN**

Previews each segment on a pre-recorded tape.

**15 SKIP REVERSE/SKIP FORWARD**

Locates the start of any desired segment on a pre-recorded tape.

**16 REPLAY**

Press on: when tape reaches end, deck automatically rewinds to start and begins Play.

**17 MEMORY**

Press on: when ◀◀ is pressed, tape rewinds to approximately 00:00 on Counter.

**18 BIAS TONE/BIAS FINE TRIM**

Adjusts when recording.

**19 RECORD/PAUSE**

Puts cassette deck in Record ready or Pause mode.

**20 PLAY**

Begins playback or recording.

**21 STOP**

Stops tape transport in any mode.

**22 REC CAL**

Adjust when recording using Dolby Noise Reduction.

**23 REWIND/FAST FORWARD**

Rapidly rewinds or advances tape.

**24 METER WEIGHTING**

Allows for easy setting of optimum record levels.

**25 OUTPUT**

Adjusts output level to headphones and receiver, pre-amp. or integrated amplifier.

**26 RECORD MUTE**

Inserts blank space when recording.

**27 MPX FILTER**

Press when using Dolby Noise Reduction while recording FM stereo broadcasts.


**28 INPUT LEVEL**

Adjusts recording level and balance.

**29 HEADPHONES**

Insert headphone plug.

**\* NOTE**

Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen. "DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

## DISASSEMBLY PROCEDURES (REFER TO PAGES 9, 10 and 11)

### [1] CABINET TOP (133) REMOVAL

Remove 4 screws (A) and 2 screws (B), and then remove the Cabinet Top (133).

### [2] FRONT PANEL ASSEMBLY (AA) REMOVAL

1. Remove the Cabinet Top (133). (Refer to step 1.)
2. Remove the Plate with window (140 and 143).
3. Remove 5 rotary knobs (151, 145 and 148) and the nut.
4. Disconnect CN903 from CN803 on the Main P. C. Board (PCB-1).
5. Remove 7 screws (C).
6. While disconnecting CN801 and CN802, remove the Front Panel Assembly (AA).

### [3] CASSETTE TAPE RECORDER MECHANISM ASSEMBLY REMOVAL

1. Remove the Front Panel Assembly (AA). (Refer to step 2.)
2. Disconnect LCN801, LCN802 and LCN803 on the Cassette Tape Recorder Mechanism Assembly.
3. Disconnect CN301 and CN105 connected to the Main P. C. Board (PCB-1).
4. Remove the spring (179).
5. Remove 4 screws (D) and then remove the Cassette Tape Recorder Mechanism Assembly.

### [4] HEADPHONE P. C. BOARD (PCB-4) REMOVAL

Remove the screw (E) and then remove the Headphone P. C. Board (PCB-5).

### [5] MAIN P. C. BOARD (PCB-1) REMOVAL

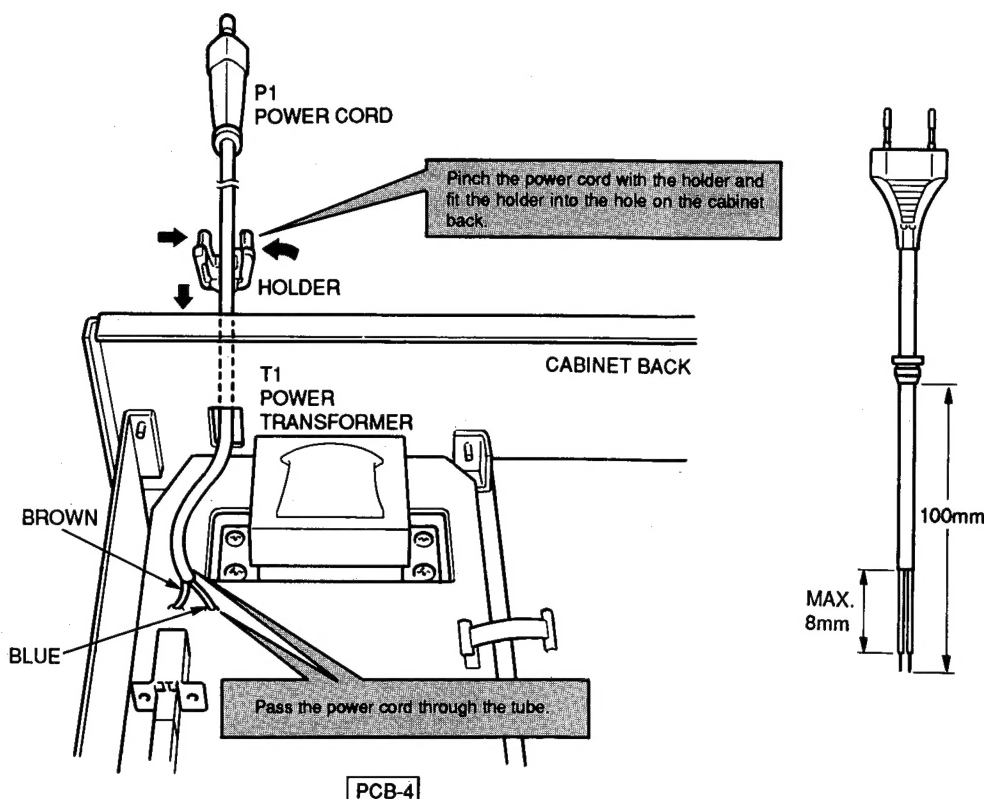
1. Remove the Cabinet Top (133). (Refer to step 1.)
2. Disconnect LCN801, LCN802 and LCN803.
3. Disconnect CN301 and CN105 on the Main P. C. Board (PCB-1), which are connected to the Cassette Tape Recorder Mechanism Assembly.
4. Disconnect CN801, CN802 and CN803 connected to the Front P. C. Board (PCB-2).
5. Open the lid of CN101, CN102, CN103 and CN104 on the Power P. C. Board (PCB-5) and then disconnect JP101, JP102, JP103 and JP104.
6. Remove the screw (F) and the metal fitting (164).
7. Disconnect CN501 and CN502 and then remove the Dolby B/C NR P. C. Board (PCB-3) from the Main P. C. Board (PCB-1).
8. Remove 8 screws (G) and then remove the Main P. C. Board (PCB-1).

### [6] OTHER P. C. BOARDS REMOVAL

1. Remove the Front Panel Assembly (AA). (Refer to step 2.)
2. Remove 8 screws (H) and 3 screws (I), then remove the Front P. C. Board (PCB-2).
3. Remove 4 screws (J) and then remove the Power P. C. Board (PCB-4). If necessary, disconnect the connectors.

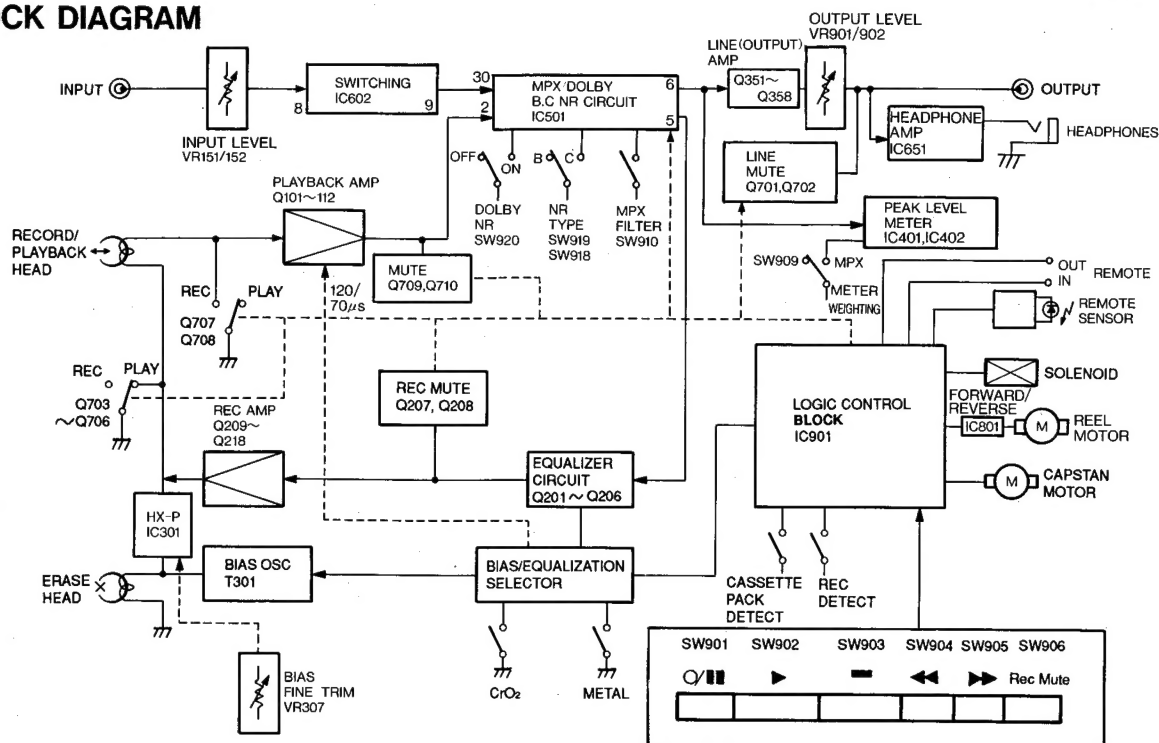
## POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire shock hazard when replacing the power cord, follow the Procedure below to replace the part with the standard supply parts.





## BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

### PLAYBACK SIGNAL

The signal from the playback head is amplified by the playback amplifier Q101, Q103, Q105, Q107, Q109 and Q111 (L ch.), and is applied to the pins 2 (L ch.) and 29 (R ch.) of the Dolby NR IC501 (B/C type). Switching of the playback signal from the record mode (external input signal) to the playback mode is performed inside IC501.

IC501 is usually switched to the playback mode. However, the control signal transmitted to the pin 5 of IC501 from IC901 through Q505 and Q506 switches IC501 from the record mode to the playback mode. The input signal to IC501 is output from the pins 6 (L ch.) and 25 (R ch.) and applied to the OUTPUT AMP., HEADPHONES jack amplified by the headphone amplifier IC651 and the PEAK LEVEL METER circuit. The characteristics of the playback equalizer are defined by the BIAS/EQUALIZATION switch and are selected and specified in Q113 (L ch.) and Q114 (R ch.)

### RECORD SIGNAL

The signal from the INPUT jack is controlled by the INPUT LEVEL control. It is applied to the pins 8 (L ch.) and 4 (R ch.) of the Switching IC602 and the pins 30 (L ch.) and 1 (R ch.) of the Dolby NR IC501 (B/C type). Switching of the record signal from the playback mode to the record mode is performed inside IC501. The control signal transmitted to the pin 5 of IC501 from IC901 through Q505 and Q506 switches IC501 from the playback mode to the record mode.

The input signal to the Dolby NR IC is output from the pins 28 (L ch.) and 3 (R ch.) of IC501 and passes through the MPX filter. Then it is input to the pins 27 (L ch.) and 4 (R ch.) and is output from the pins 24 (L ch.) and 7 (R ch.). The encoded signal is input to the pins 23 (L ch.) and 8 (R ch.) and then it is output from the pins 18 (L ch.) and 13 (R ch.). The signal output from IC501 passes through the record equalizer circuit and is amplified by the record amplifier of Q209, Q211, Q213, Q215 and Q217

(L ch.), Q210, Q212, Q214, Q216, and Q218 (R ch.). The amplified signal is then applied to the recording head after being synthesized by a bias signal.

### MUTING OPERATION

The signal that mutes the sound produced at switching to recording or playback is applied from IC901 of the logic control block.

When the "STOP" button is pressed, the mute signal output from the pin 28 of IC901 turns ON Q701 (L ch.) and Q702 (R ch.) to short-circuit the output signals of the playback amplifiers for muting. For the purpose of preventing generation of noise at power ON/OFF, the mute signal is output from Q51. The muting is done by short circuiting the output signal with Q701 (L ch.) and Q702 (R ch.) turned ON.

### LOGIC FOR RECORD MODE

When the "REC" button is pressed, the pin 27 of IC901 becomes high level and Q709 (L ch.) and Q710 (R ch.) turn ON. The input to the Dolby NR IC is muted. Also Q715 and Q714 turn ON and Q713 turns OFF. Therefore Q703, Q705 (L ch.) and Q704, Q706 (R ch.) turn OFF to release the muting of the outputs from the record amplifiers.

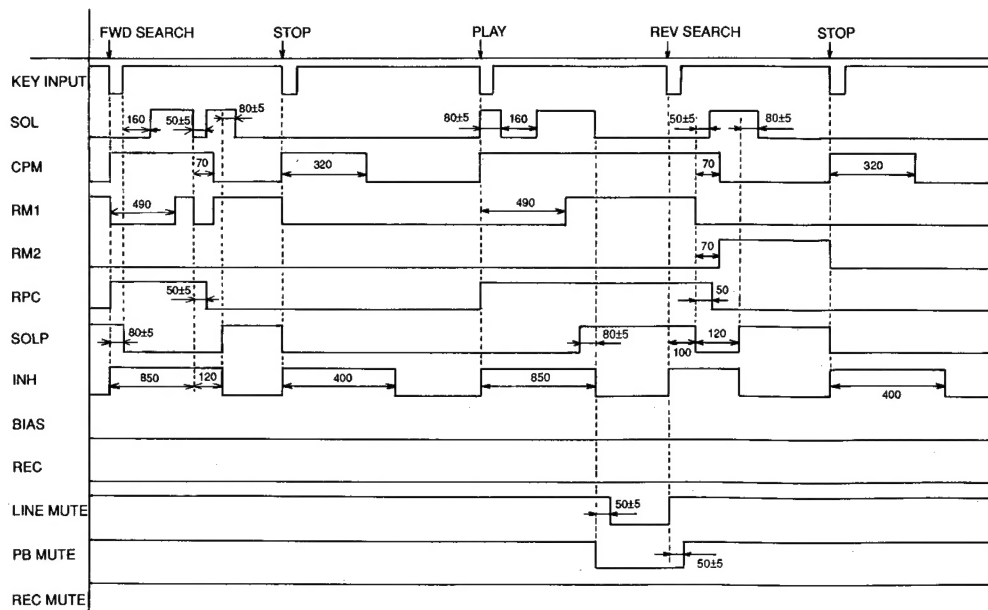
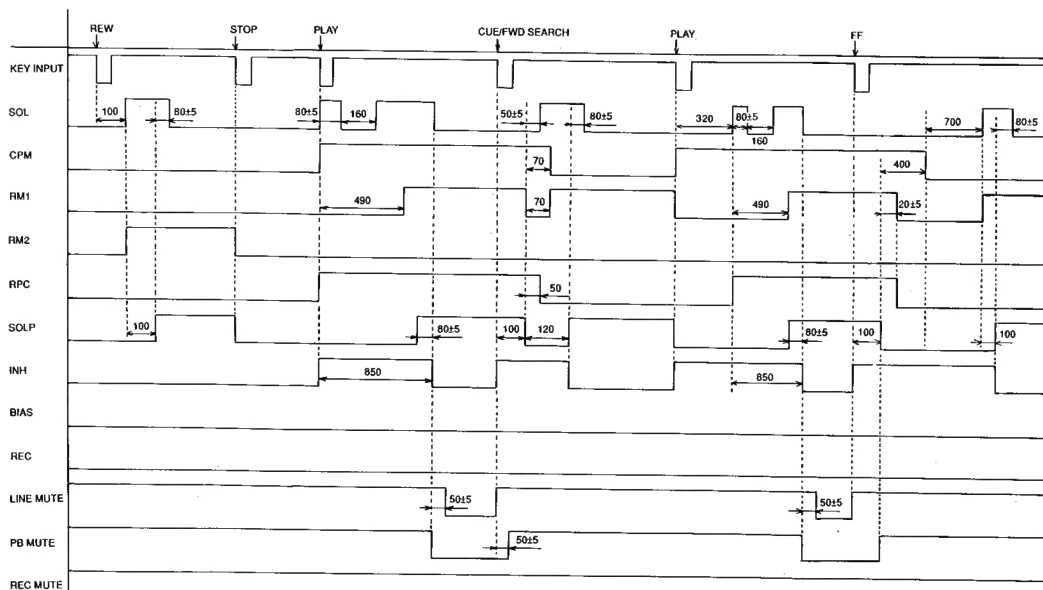
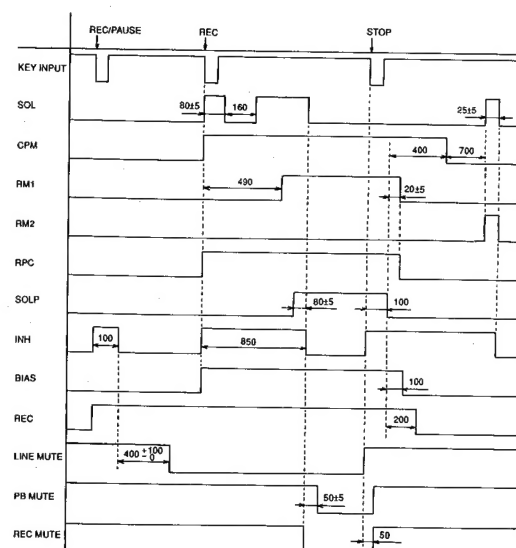
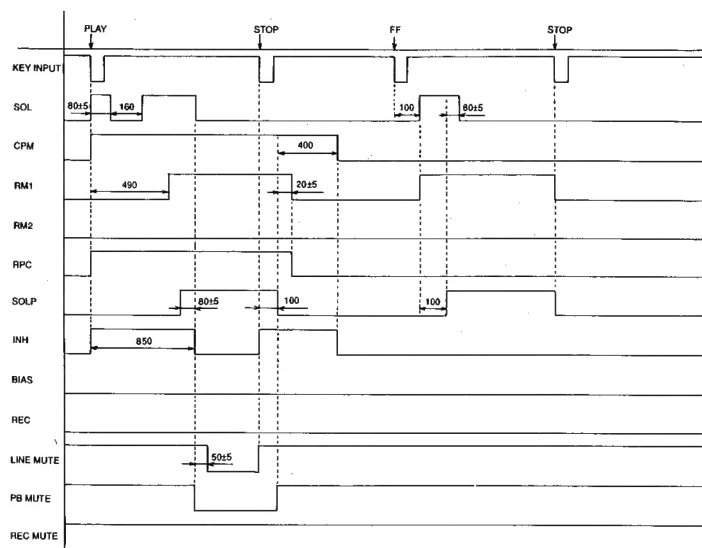
Also, Q505 turns ON and Q506 turns OFF to make the pin 5 of IC501 high level. Therefore the mode is switched to the record mode.

### LOGIC FOR RECORD TO PLAYBACK MODE

When the "STOP", "PAUSE" or "PLAY" button is pressed, the pin 26 of IC901 becomes high level. Q219 turns ON and Q207 (L ch.), Q208 (R ch.) turn ON to mute the inputs to the record amplifiers. Also, Q715 and Q714 turn OFF and Q713 turns ON to turn ON Q703, Q705 (L ch.) and Q704, Q706 (R ch.). Therefore the outputs from the record amplifiers are muted.

Also, Q505 turns OFF and Q506 turns ON to make the pin 5 of IC501 low level. Therefore the mode is switched to the playback mode.

## TIMING CHART



ALIGNMENT PROCEDURES (REFER TO PAGES 12, 13, 21, 22 AND 23)

CASSETTE MECHANISM CONFIRMATION

Make sure to confirm conditions of the cassette mechanism as follows before adjustment.

1. Confirmation of erase prevention function

- The switch should turn ON when a tape with erroneous erase preventive pawl is inserted. (Use a tape which is 0.2mm smaller than the minimum size of 62.9mm or a MAZ-0184-C gauge one.)
- When the switch arm is moved back gradually from the ON position, the switch should turn OFF.

2. Confirmation of cassette pack detection function

- The switch should turn ON when a tape is inserted. (Use a tape whose minimum size is 63.5mm or a MAZ-0184-C gauge one.)
- When the switch arm is moved back gradually from the ON position, the switch should turn OFF.

3. Confirmation of eject function

- The cassette compartment opens smoothly and no abnormal noise should be heard while opening and closing.
- The eject lock arm opens smoothly without contacting the chassis and damper.
- The eject button can not be pressed during playback.

4. Confirmation of playback, fast forward and rewind functions

- The torque used in each of the playback, fast forward and rewind modes should be within specification.  
Playback .....35gr.cm ~ 70gr.cm  
Fast Forward .....70gr.cm ~ 150gr.cm  
Rewind .....70gr.cm ~ 150gr.cm
- No abnormal noise should be heard during operation in any mode. The solenoid switching sound should not be considered as a noise.

5. Confirmation of positions of record/playback head and erase head

- Head height
  - a) Set the M-300 head gauge.
  - b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 1.
  - c) The adjustment chip should not contact the tape guide of both record/playback head and erase head.

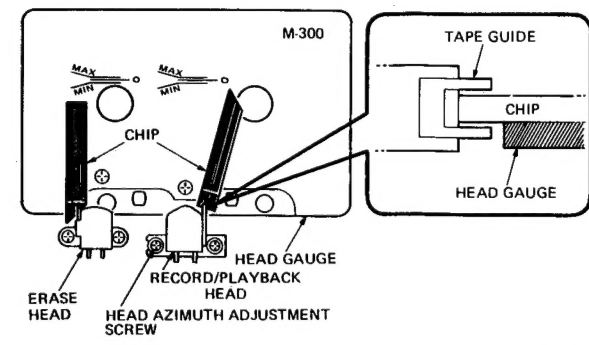


Fig. 1

- Head position
  - a) Set the M-300 head gauge.
  - b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 2.
  - c) With both record/playback head and erase head, the adjustment chip should be between MIN and MAX of the M-300 head gauge.

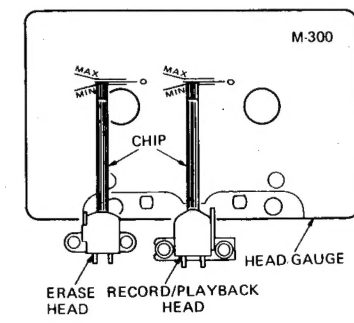


Fig. 2

ELECTRICAL ADJUSTMENT AND CONFIRMATION

1. Before adjustment

- Before electrical adjustment, make sure that confirmations of the cassette mechanism are all completed.
- After the power switch is pushed on, wait for 10 minutes before measuring to be sure of the most stable operation.
- Since head magnetization, dust accumulations, etc. are likely to introduce errors in the various characteristics, it is very important that the heads are properly demagnetized and cleaned before commencing any adjustment, particularly frequency response and head azimuth adjustment.

2. Instruments required

- Low frequency oscillator
- AC VTVM or dual channel AC VTVM
- Oscilloscope
- Wow/flutter meter
- Frequency counter
- Distortion meter

3. Test tapes

- Azimuth adjustment .....MTT-114 or TCC-153
- Tape speed adjustment.....MTT-111DN or TCC-112
- Playback output level adjustment ..... MTT-150 or TCC-130
- Music search adjustment .....SCC-1425
- Playback frequency characteristic confirmation .....TCC-1216 or TCC-162C and TCC-262C
- Reference tapes
  - LN .....SCC-502
  - CrO<sub>2</sub> .....SCC-1360
  - METAL .....SCC-565

Note:

C-90 differs with C-60 in the thickness and bias is of unequal, so adjust with the tape whose bias is of specified value.

4. General conditions (unless otherwise noted)

Controls and Switches	Settings
Dolby NR	Off
Input Level	Maximum
MPX Filter	Off
Bias Fine Trim	Center
Balance	Center

Azimuth Adjustment

When the maximum level point of R channel does not equal that L channel, connect the oscilloscope as shown in Fig. 3 and proceed with azimuth adjustment so that L and R channels are in phase.

- a) Connect L channel tape out to "X (or V)" and R channel to "Y (or H)". Observe the lissajous waveform.
- b) Set L and R channels to monaural. Adjust vertical and horizontal gain so that the waveform becomes 45 degree.
- c) Adjust azimuth so that the measurement of "a" becomes maximum and the measurement of "b" becomes minimum against the 45 degree line.

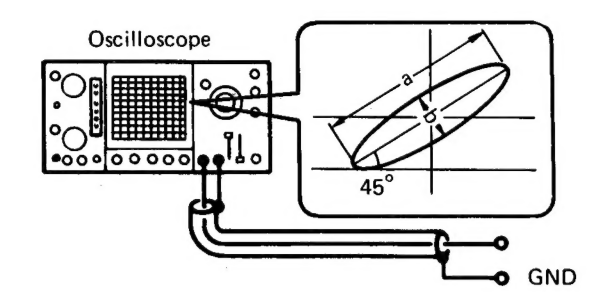
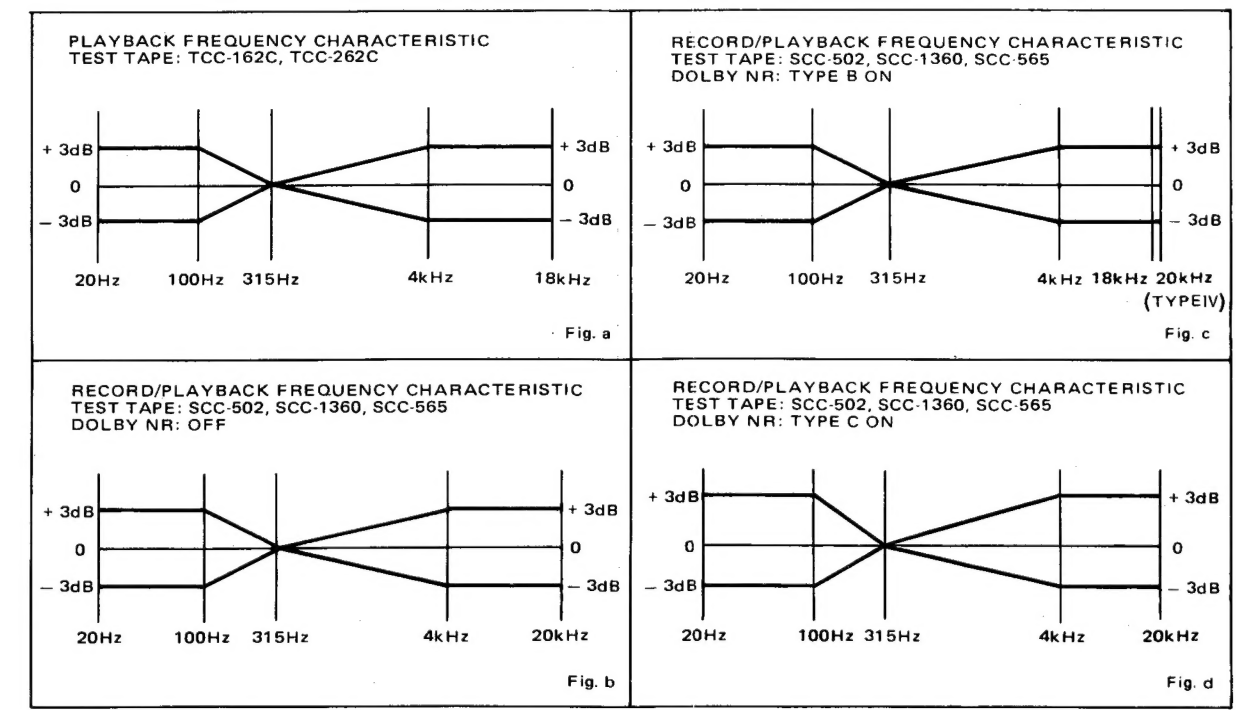


Fig. 3



## ALIGNMENT PROCEDURES (REFER TO PAGES 12, 13, 21, 22 AND 23)

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- The switch should turn ON when a tape is inserted. (Use a tape whose minimum size is 63.5mm or a MAZ-0184-C gauge one.)
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- The cassette compartment opens smoothly and no abnormal noise should be heard while opening and closing.
- The eject lock arm opens smoothly without contacting the chassis and damper.
- The eject button can not be pressed during playback.

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- The torque used in each of the playback, fast forward and rewind modes should be within specification.  
Playback .....35gr.cm~ 70gr.cm  
FastForward .....70gr.cm~150gr.cm  
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  - a) Set the M-300 head gauge.
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#### • Head position

- a) Set the M-300 head gauge.
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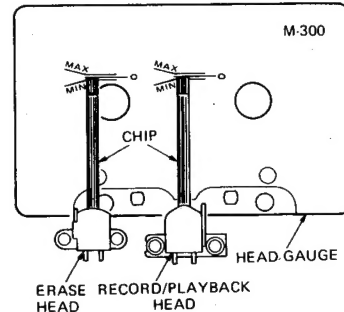


Fig. 2

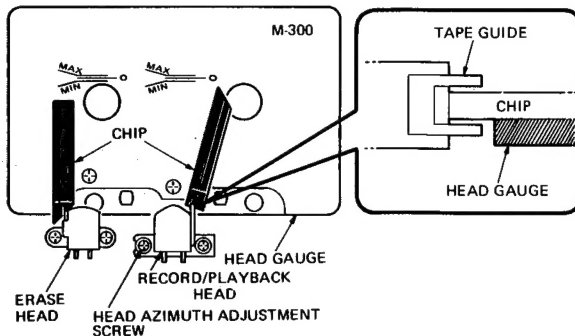


Fig. 1

## ELECTRICAL ADJUSTMENT AND CONFIRMATION

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### 2. Instruments required

- Low frequency oscillator
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- Oscilloscope
- Wow/flutter meter
- Frequency counter
- Distortion meter

### 3. Test tapes

- Azimuth adjustment .....MTT-114 or TCC-153
- Tape speed adjustment.....MTT-111DN or TCC-112
- Playback output level adjustment .....  
MTT-150 or TCC-130
- Music search adjustment.....SCC-1425
- Playback frequency characteristic confirmation  
.....TCC-1216 or TCC-162C and TCC-262C
- Reference tapes  
LN .....SCC-502  
CrO<sub>2</sub> .....SCC-1360  
METAL .....SCC-565

#### Note:

C-90 differs with C-60 in the thickness and bias is of unequal, so adjust with the tape whose bias in of specified value.

### 4. General conditions (unless otherwise noted)

Controls and Switches	Settings
Dolby NR	Off
Input Level	Maximum
MPX Filter	Off
Bias Fine Trim	Center
Balance	Center

#### Azimuth Adjustment

When the maximum level point of R channel does not equal that L channel, connect the oscilloscope as shown in Fig. 3 and proceed with azimuth adjustment so that L and R channels are in phase.

- Connect L channel tape out to "X (or V)" and R channel to "Y (or H)". Observe the lissajous waveform.
- Set L and R channels to monaural. Adjust vertical and horizontal gain so that the waveform becomes 45 degree.
- Adjust azimuth so that the measurement of "a" becomes maximum and the measurement of "b" becomes minimum against the 45 degree line.

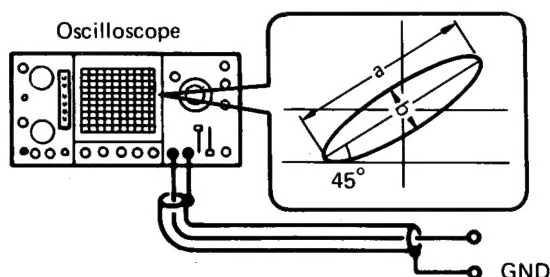
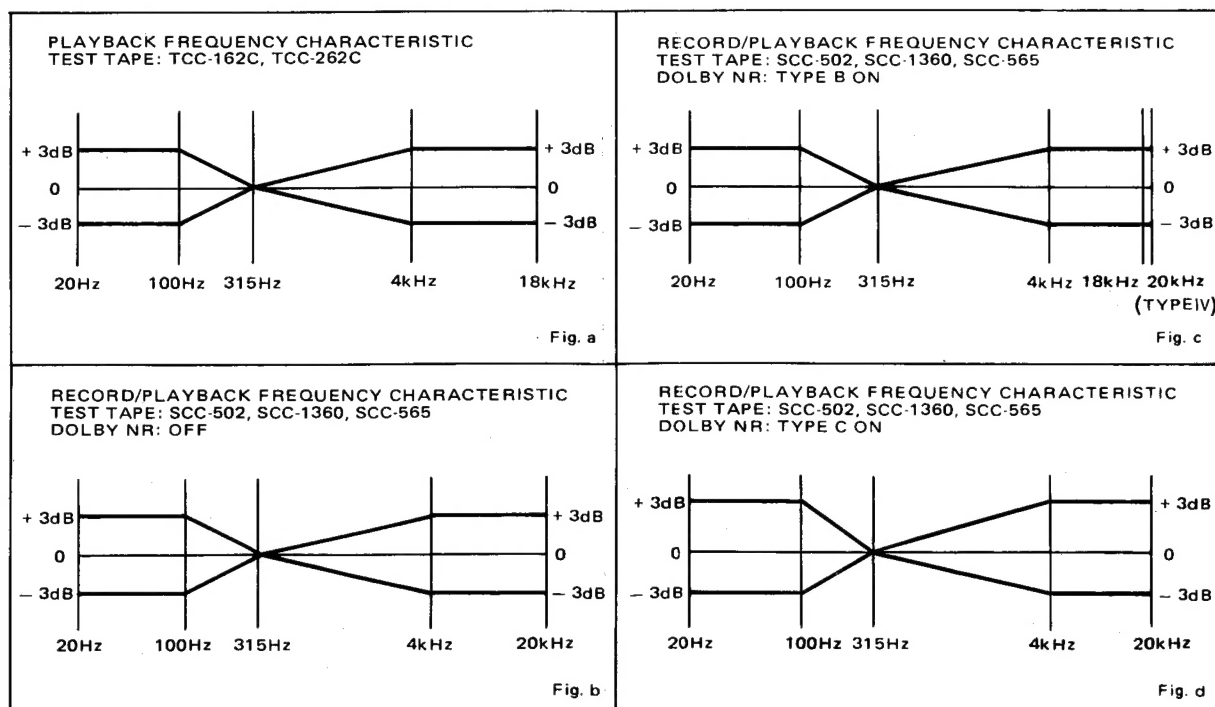


Fig. 3



Step	Alignment	Instrument Required	Input Signal	Mode	Test Point	Adjustment	For
1	Azimuth	VTVM Oscilloscope Test tape (MTT-114 or TCC-153)		PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	Azimuth screw	Maximum output Refer to "Azimuth Adjustment" on page 7.
2	Tape speed	Frequency counter Test tape (MTT-111DN or TCC-112)		PB	TP501 (Lch), GND TP502 (Rch), GND	VR (built in motor)	3000Hz $\pm$ 10Hz Adjust at the center of test tape.
3	Playback output level	VTVM Test tape (MTT-150 or TCC-130)		PB	TP501 (Lch), GND TP502 (Rch), GND	VR101 (Lch) VR102 (Rch)	388mV Tape selector is LN position.
4	Record calibration tone			REC/PAUSE Rec. Cal. (SW921) ON	TP501 (Lch), GND TP502 (Rch), GND	VR602	388mV
5	Bias tone			REC/PAUSE Bias tone (SW907) ON	TP501 (Lch), GND TP502 (Rch), GND	VR603 VR601	388mV -20dB (39mV about 400Hz) 388mV -20dB (39mV about 12.5kHz)
6	Music search	Oscilloscope Test tape (SCC-1425)		FORWARD SEARCH	TP751, GND	VR751	1.6 $\pm$ 0.05V
7	Playback frequency characteristic confirmation	VTVM Test tape (TCC-1216 or TCC-162C and TCC-262C)		PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	R133, R134	Unsolder a resistor of R133 or R134 so that the frequency response is within the range as shown in Fig. a.
8	Bias frequency confirmation	Frequency counter		REC/PB	TP101 (Lch), GND TP102 (Rch), GND	T301	105kHz $\pm$ 3kHz Tape selector is METAL position.
9	Dolby HX PRO			REC/PB	TP101 (Lch), GND TP102 (Rch), GND	L301 L302	Maximum output Tape selector is METAL position. After adjustment for L301 and L302, set bias fine trim (VR301 and VR302) to the center position.
10	Bias trap	VTVM		REC/PB	TP201 (Lch), GND TP202 (Rch), GND	LC201, LC202 LC203, LC204	Minimum output Tape selector is METAL position.
11	Bias level (pre-adjustment)	VTVM		REC/PB	TP101 (Lch), GND TP102 (Rch), GND	VR301 VR302	40mV Tape selector is METAL position.
						VR305 VR306	25mV Tape selector is CrO <sub>2</sub> position.
						VR303 VR304	15mV Tape selector is LN position.
12	Record level (pre-adjustment)	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV in REC-PAUSE mode.	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR203, VR204 VR301, VR302	388mV Tape selector is METAL position. Adjust VR301 and VR302 so that the distortion becomes 1.0%~1.4%
						VR305, VR306 (CrO <sub>2</sub> ) VR303, VR304 (LN)	388mV Adjust VR305 and VR306 so that the distortion becomes 1.3% (CrO <sub>2</sub> ). Adjust VR303 and VR304 so that the distortion becomes 1.0% (LN). This confirmation should be at each tape selector position.
13	Record/playback equalizer frequency characteristic	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 388mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB	OUTPUT jack	VR305, VR306 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is CrO <sub>2</sub> position.
						VR301 VR302	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is METAL position.
						VR305, VR306 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is LN position.
14	Record level	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV in REC-PAUSE mode.	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR203 VR204	388mV Perform adjustment using CrO <sub>2</sub> . Perform checking only for LN and METAL tapes.
15	Meter level	VTVM	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 1.5dB below 388mV.	REC/PAUSE	PEAK LEVEL METER	VR401 VR402	Confirm peak level meter reads: - 1dB.
16	MPX filter characteristic confirmation	VTVM	Apply 19kHz, 15kHz and 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV.	REC/PAUSE MPX filter ON	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	LC501 LC502	Adjust for -0.3dB at 15kHz and >30dB at 19kHz.
17	Record/playback equalizer frequency characteristic confirmation	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 400Hz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 388mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB	OUTPUT jack		Perform checking with Dolby B and C NR ON at each tape selector position. Confirm the record/playback frequency characteristic is within $\pm$ 3dB at 20Hz to 20kHz.

Step	Alignment	Instrument Required	Input Signal	
1	Azimuth	VTVM Oscilloscope Test tape (MTT-114 or TCC-153)		PE
2	Tape speed	Frequency counter Test tape (MTT-111DN or TCC-112)		PE
3	Playback output level	VTVM Test tape (MTT-150 or TCC-130)		PE
4	Record calibration tone			RE RE (S)
5	Bias tone			RE B (S)
6	Music search	Oscilloscope Test tape (SCC-1425)		F S
7	Playback frequency characteristic confirmation	VTVM Test tape (TCC-1216 or TCC-162C and TCC-262C)		P
8	Bias frequency confirmation	Frequency counter		R
9	Dolby HX PRO			R
10	Bias trap	VTVM		R
11	Bias level (pre-adjustment)	VTVM		F
12	Record level (pre-adjustment)	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV in REC-PAUSE mode.	F
13	Record/playback equalizer frequency characteristic	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 388mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	F
14	Record level	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV in REC-PAUSE mode.	F
15	Meter level	VTVM	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 1.5dB below 388mV.	F
16	MPX filter characteristic confirmation	VTVM	Apply 19kHz, 15kHz and 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 388mV.	F
17	Record/playback equalizer frequency characteristic confirmation	VTVM Blank tapes CrO <sub>2</sub> SCC-1360 METAL SCC-565 LN SCC-502	Apply 400Hz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 388mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	F

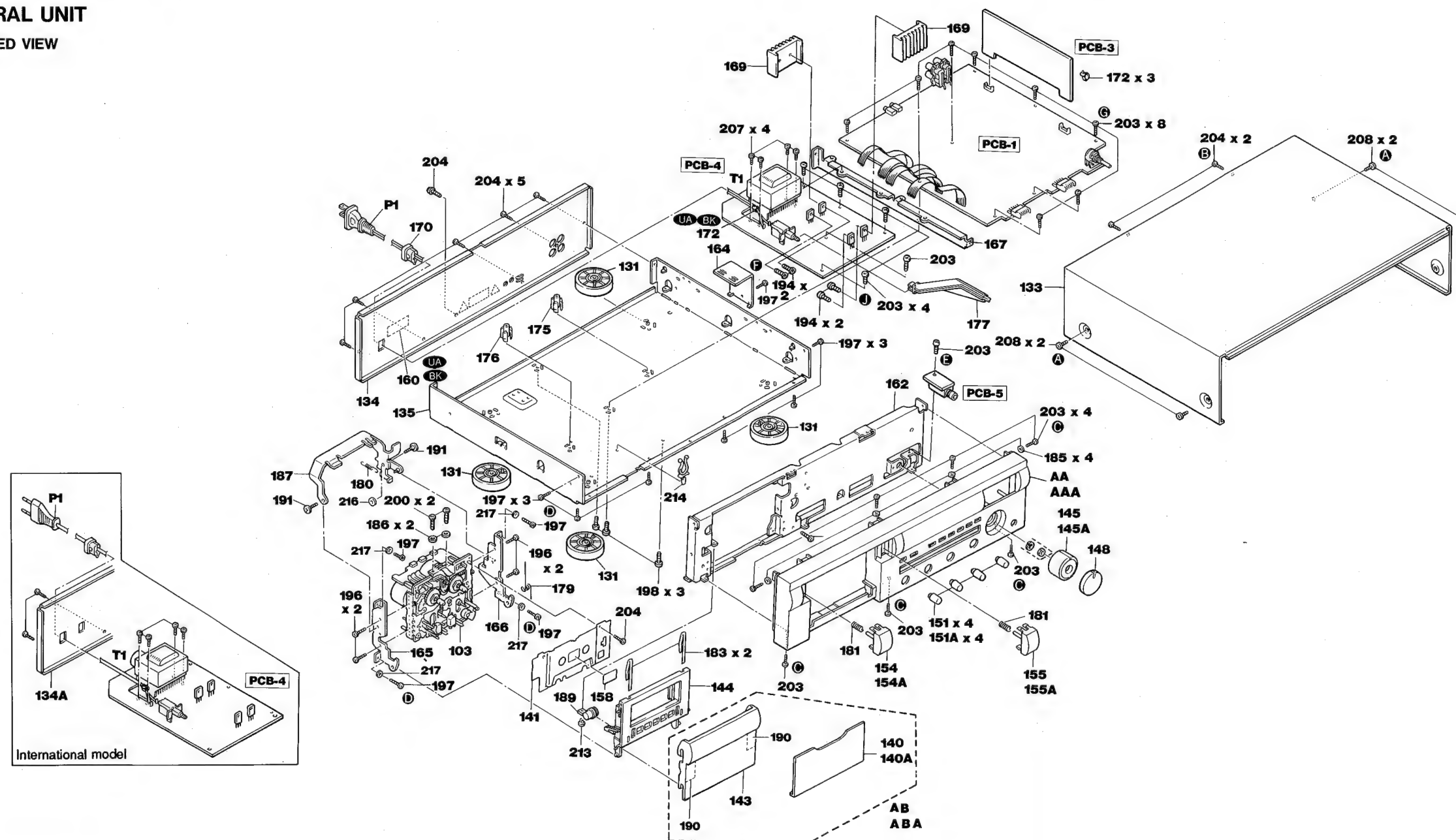


	Mode	Test Point	Adjustment	For
	PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	Azimuth screw	Maximum output Refer to "Azimuth Adjustment" on page 7.
	PB	TP501 (Lch), GND TP502 (Rch), GND	VR (built in motor)	3000Hz $\pm$ 10Hz Adjust at the center of test tape.
	PB	TP501 (Lch), GND TP502 (Rch), GND	VR101 (Lch) VR102 (Rch)	388mV Tape selector is LN position.
	REC/PAUSE Rec. Cal. (SW921) ON	TP501 (Lch), GND TP502 (Rch), GND	VR602	388mV
	REC/PAUSE Bias tone (SW907) ON	TP501 (Lch), GND	VR603	388mV -20dB (39mV about 400Hz)
		TP502 (Rch), GND	VR601	388mV -20dB (39mV about 12.5kHz)
	FORWARD SEARCH	TP751, GND	VR751	1.6 $\pm$ 0.05V
	PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	R133, R134	Unsolder a resistor of R133 or R134 so that the frequency response is within the range as shown in Fig. a.
	REC/PB	TP101 (Lch), GND TP102 (Rch), GND	T301	105kHz $\pm$ 3kHz Tape selector is METAL position.
	REC/PB	TP101 (Lch), GND TP102 (Rch), GND	L301 L302	Maximum output Tape selector is METAL position. After adjustment for L301 and L302, set bias fine trim (VR301 and VR302) to the center position.
	REC/PB	TP201 (Lch), GND TP202 (Rch), GND	LC201, LC202 LC203, LC204	Minimum output Tape selector is METAL position.
	REC/PB	TP101 (Lch), GND TP102 (Rch), GND	VR301 VR302	40mV Tape selector is METAL position.
			VR305 VR306	25mV Tape selector is CrO <sub>2</sub> position.
			VR303 VR304	15mV Tape selector is LN position.
so that SE	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR203, VR204 VR301, VR302	388mV Tape selector is METAL position. Adjust VR301 and VR302 so that the distortion becomes 1.0%~1.4%
			VR305, VR306 (CrO <sub>2</sub> ) VR303, VR304 (LN)	388mV Adjust VR305 and VR306 so that the distortion becomes 1.3% (CrO <sub>2</sub> ). Adjust VR303 and VR304 so that the distortion becomes 1.0% (LN). This confirmation should be at each tape selector position.
so that in REC-	REC/PB	OUTPUT jack	VR305, VR306 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is CrO <sub>2</sub> position.
			VR301 VR302	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is METAL position.
			VR305, VR306 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is LN position.
	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR203 VR204	388mV Perform adjustment using CrO <sub>2</sub> . Perform checking only for LN and METAL tapes.
so that	REC/PAUSE	PEAK LEVEL METER	VR401 VR402	Confirm peak level meter reads: - 1dB.
INPUT 388mV.	REC/PAUSE MPX filter -ON	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	LC501 LC502	Adjust for -0.3dB at 15kHz and >30dB at 19kHz.
ob so that in REC-	REC/PB	OUTPUT jack		Perform checking with Dolby B and C NR ON at each tape selector position. Confirm the record/playback frequency characteristic is within $\pm$ 3dB at 20Hz to 20kHz.



## GENERAL UNIT

## EXPLODED VIEW



## PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4500A	FRONT PANEL ASS'Y UA IB
AAA	A442-TD4500B	FRONT PANEL ASS'Y BK IB BB
AB	A512-TD4500A	CASSETTE LID ASS'Y UA IB
ABA	A512-TD4500B	CASSETTE LID ASS'Y BK IB BB
103	3112-13706	CASSETTE TAPE RECORDER MECHANICAL ASS'Y
131	1319-03301	LEG
133	1414-15901	CABINET, TOP COVER
134	1424-31609	CABINET BACK, REAR UA BK
134A	1424-31610	CABINET BACK, REAR IB IB BB
135	1424-31801	CABINET BACK, BOTTOM
140	1512-06806	PLATE UA IB
140A	1512-06802	PLATE BK IB BB
141	1514-23201	PLATE
143	1532-19501	WINDOW
144	1612-07401	CASSETTE LID
145	1630-04402	ROTARY KNOB UA IB
145A	1630-04401	ROTARY KNOB BK IB BB

Ref. No.	Part No.	Description
148	1630-04502	ROTARY KNOB UA IB
148A	1630-04501	ROTARY KNOB BK IB BB
151	1632-20402	ROTARY KNOB UA IB
151A	1632-20401	ROTARY KNOB BK IB BB
154	1662-58403	PUSH BUTTON UA IB
154A	1662-58401	PUSH BUTTON BK IB BB
155	1662-58404	PUSH BUTTON UA IB
155A	1662-58402	PUSH BUTTON BK IB BB
158	1741-01601	ORNAMENT
160	1756-CSA	LABEL UA BK
162	2211-7311	CHASSIS
164	2219-8285	METAL FITTING
165	2219-8288	METAL FITTING
166	2219-8289	METAL FITTING
167	2219-8293	METAL FITTING
169	2222-7281	HEAT SINK
170	2240-364	HOLDER
172	2240-R0101	HOLDER

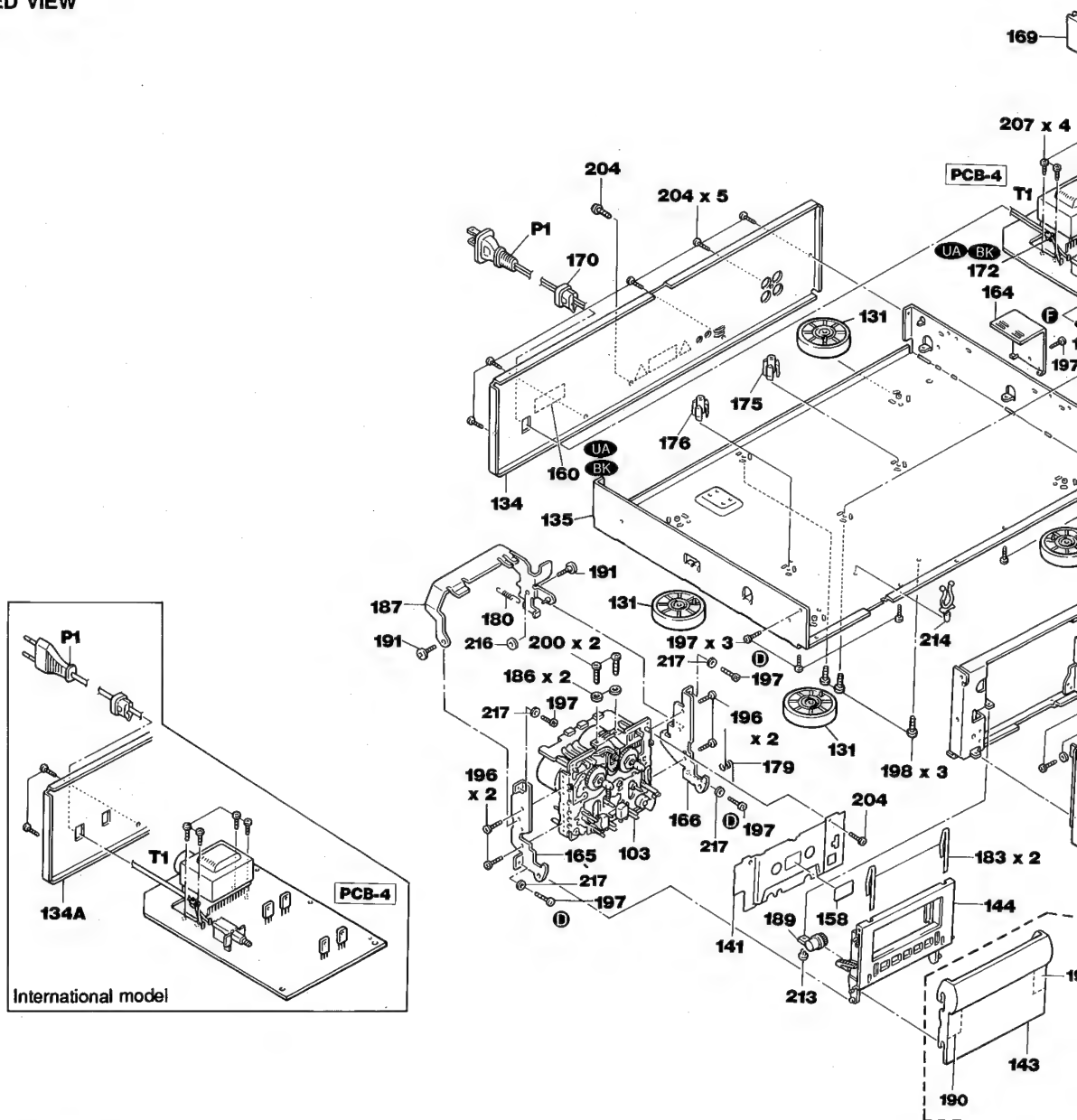
Ref. No.	Part No.	Description
175	2360-7022	BOSS
176	2360-7063	BOSS
177	2601-7192	SHAFT
179	2651-047	SPRING
180	2651-11212	SPRING, LEVER
181	2651-2101732	SPRING
183	2652-105	LEAF SPRING
185	2411-3021	WASHER, PLAIN
186	2411-40Z1	WASHER, PLAIN
187	2672-7044	LEVER
189	2692-016	DAMPER
191	2320-044	SCREW, SPECIAL
194	2327-R0130082	SCREW (3X8mm)
196	2347-300527	SCREW
197	2347-R0130062	SCREW (3X6mm)
198	2347-R0130062	SCREW (3X6mm)
200	2343-300627	SCREW
203	2347-R0130082	SCREW (3X8mm)

Ref. No.	Part No.	Description
204	2347-R0130084	SCREW (3X8mm)
207	2347-R0140062	SCREW (4X6mm)
208	2347-R0140064	SCREW (4X6mm)
213	2459-3005511	RIVET, PLASTIC
214	2240-7049	HOLDER
216	2403-303	WASHER, POLY
217	2414-302	WASHER
△ P1	4161-71151	CORD W/PLUG UA BK
△ P1	4161-7256	CORD W/PLUG IB IB
△ P1	4161-04100	CORD W/PLUG BB
△ T1	5584-S8501	XFORMER, POWER UA BK
△ T1	5584-S8202	XFORMER, POWER IB IB BB

**NOTE**  
 ⚠ SAFETY RELATED COMPONENT. USE ONLY  
 EXACT REPLACEMENT PART AS SPECIFIED.

# GENERAL UNIT

## EXPLODED VIEW

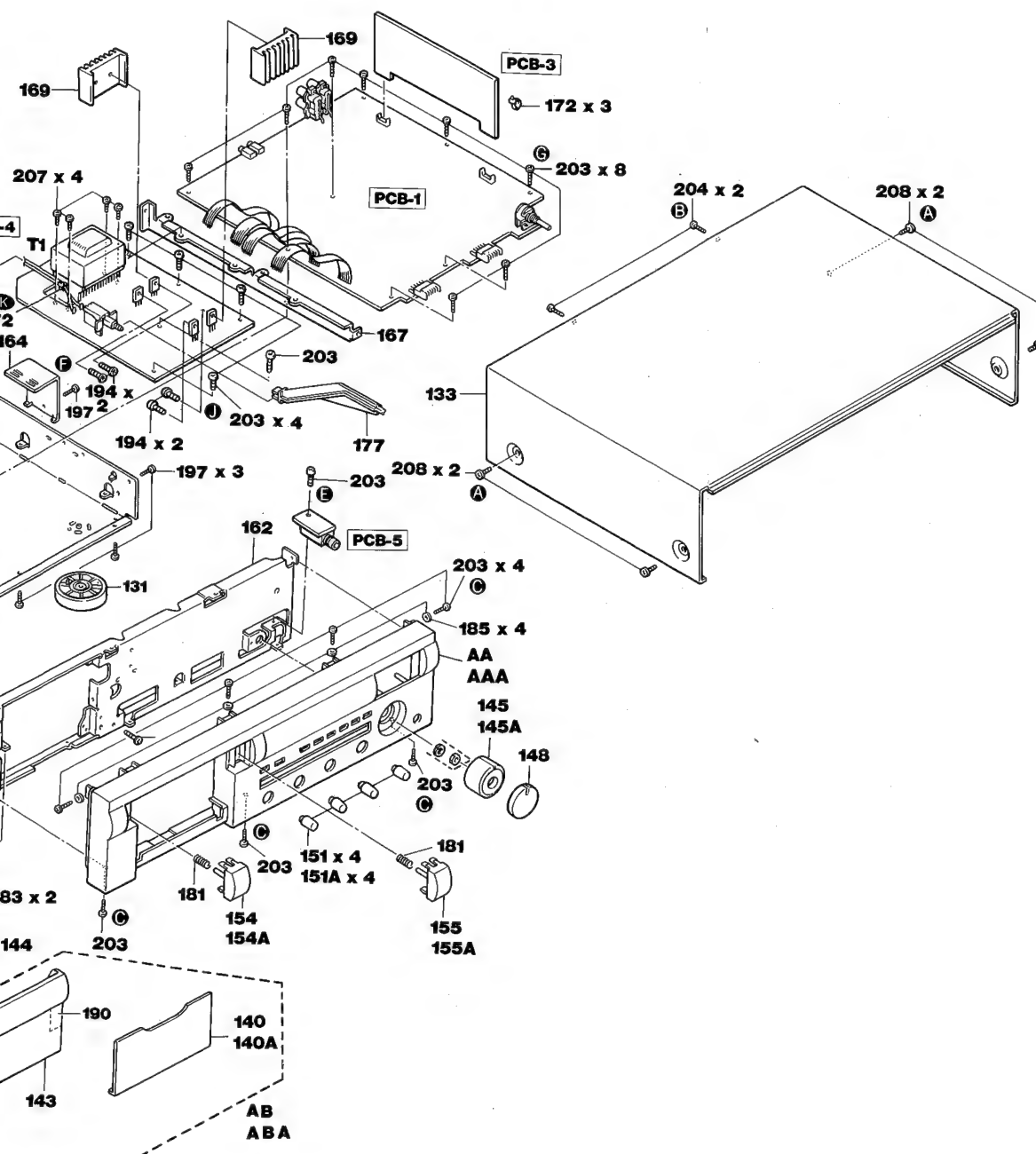


### PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4500A	FRONT PANEL ASS'Y UA I
AAA	A442-TD4500B	FRONT PANEL ASS'Y BK IB BB
AB	A512-TD4500A	CASSETTE LID ASS'Y UA I
ABA	A512-TD4500B	CASSETTE LID ASS'Y BK IB BB
103	3112-13706	CASSETTE TAPE RECORDER MECHANICAL ASS'Y
131	1319-03301	LEG
133	1414-15901	CABINET, TOP COVER
134	1424-31609	CABINET BACK, REAR UA BK
134A	1424-31610	CABINET BACK, REAR I IB BB
135	1424-31801	CABINET BACK, BOTTOM
140	1512-06806	PLATE UA I
140A	1512-06802	PLATE BK IB BB
141	1514-23201	PLATE
143	1532-19501	WINDOW
144	1612-07401	CASSETTE LID
145	1630-04402	ROTARY KNOB UA I
145A	1630-04401	ROTARY KNOB BK IB BB

Ref. No.	Part No.	Description
148	1630-04502	ROTARY KNOB UA I
148A	1630-04501	ROTARY KNOB BK IB BB
151	1632-20402	ROTARY KNOB UA I
151A	1632-20401	ROTARY KNOB BK IB BB
154	1662-58403	PUSH BUTTON UA I
154A	1662-58401	PUSH BUTTON BK IB BB
155	1662-58404	PUSH BUTTON UA I
155A	1662-58402	PUSH BUTTON BK IB BB
158	1741-01601	ORNAMENT
160	1756-CSA	LABEL UA BK
162	2211-7311	CHASSIS
164	2219-8285	METAL FITTING
165	2219-8288	METAL FITTING
166	2219-8289	METAL FITTING
167	2219-8293	METAL FITTING
169	2222-7281	HEAT SINK
170	2240-364	HOLDER
172	2240-R0101	HOLDER

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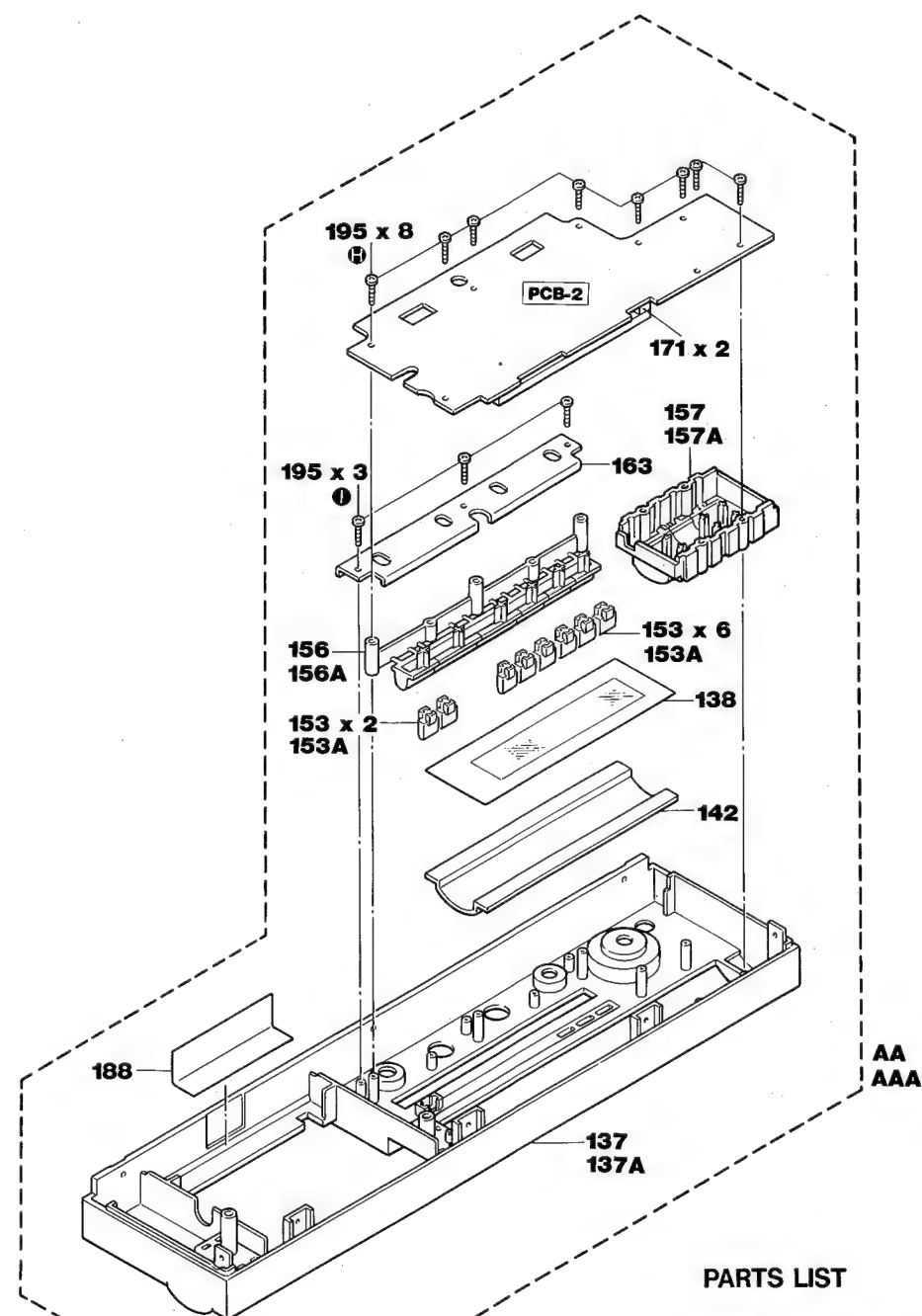
Ref. No.	Part No.	Description
175	2360-7022	BOSS
176	2360-7063	BOSS
177	2601-7192	SHAFT
179	2651-047	SPRING
180	2651-11212	SPRING, LEVER
181	2651-2101732	SPRING
183	2652-105	LEAF SPRING
185	2411-30Z1	WASHER, PLAIN
186	2411-40Z1	WASHER, PLAIN
187	2672-7044	LEVER
189	2692-016	DAMPER
191	2320-044	SCREW, SPECIAL
194	2327-R0130082	SCREW (3X8mm)
196	2347-300527	SCREW
197	2347-R0130062	SCREW (3X6mm)
198	2347-R0130062	SCREW (3X6mm)
200	2343-300627	SCREW
203	2347-R0130082	SCREW (3X8mm)

Ref. No.	Part No.	Description
204	2347-R0130084	SCREW (3X8mm)
207	2347-R0140062	SCREW (4X6mm)
208	2347-R0140064	SCREW (4X6mm)
213	2459-3005511	RIVET, PLASTIC
214	2240-7049	HOLDER
216	2403-303	WASHER, POLY
217	2414-302	WASHER
△ P1	4161-71151	CORD W/PLUG UA BK
△ P1	4161-7256	CORD W/PLUG I IB
△ P1	4161-04100	CORD W/PLUG BB
△ T1	5584-S8501	XFORMER, POWER UA BK
△ T1	5584-S8202	XFORMER, POWER I IB BB

# NOTE

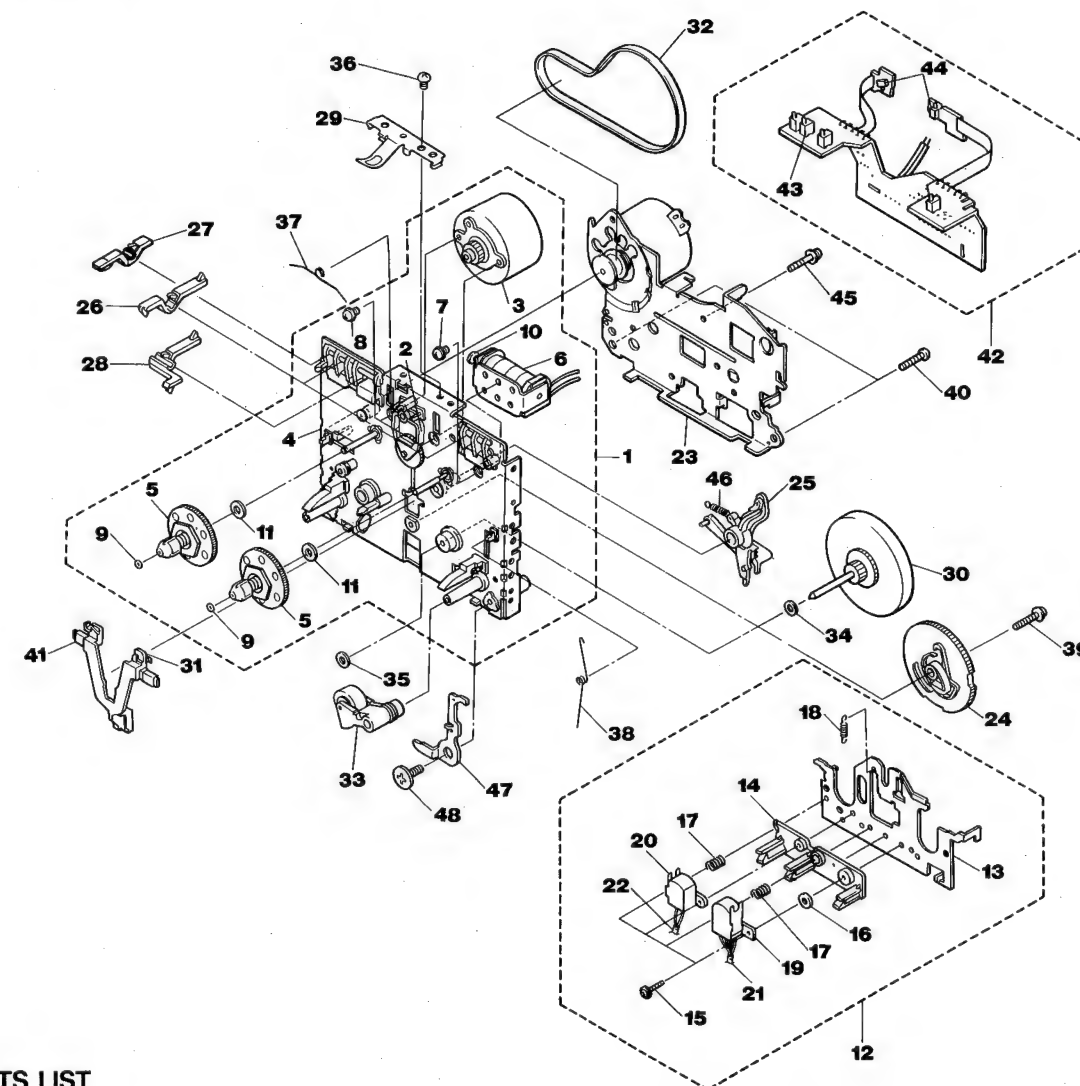
SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

## EXPLODED VIEW



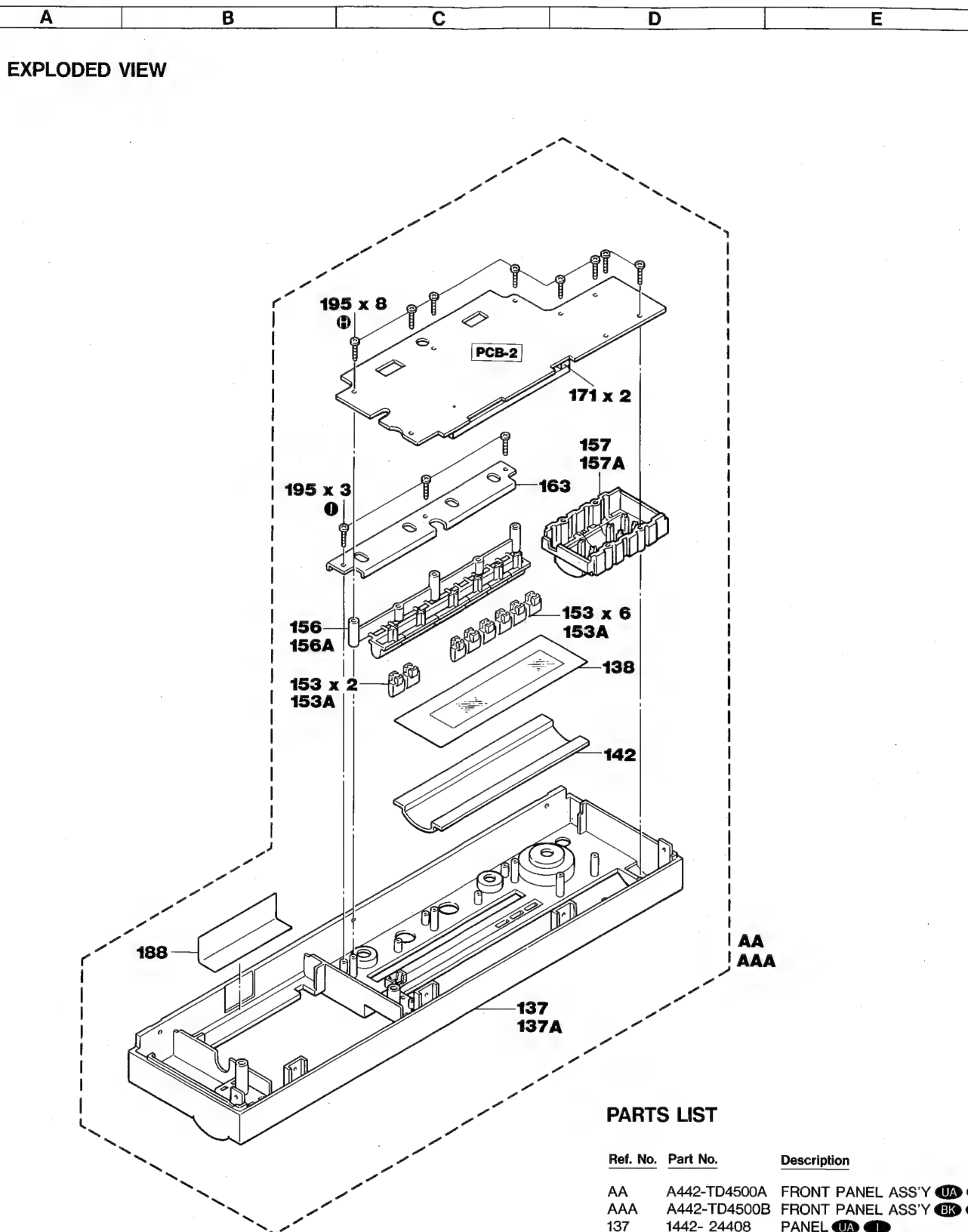
## PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4500A	FRONT PANEL ASS'Y UA I
AAA	A442-TD4500B	FRONT PANEL ASS'Y BK IB BB
137	1442- 24408	PANEL UA I
137A	1442- 24405	PANEL BK IB BB
138	1511-19807	PLATE
142	1532- 17505	WINDOW
153	1662- 52303	PUSH BUTTON UA I
153A	1662- 52301	PUSH BUTTON BK IB BB
156	1662- 58502	PUSH BUTTON UA I
156A	1662-58501	PUSH BUTTON BK IB BB
157	1662- 52204	PUSH BUTTON UA I
157A	1662- 52203	PUSH BUTTON BK IB BB
163	2219-8284	METAL FITTING
171	2240-7370	HOLDER
188	2216-7195	SHIELD PLATE
195	2347-R0126082	SCREW (2.6X8mm)

CASSETTE TAPE RECORDER MECHANISM  
EXPLODED VIEW

## PARTS LIST

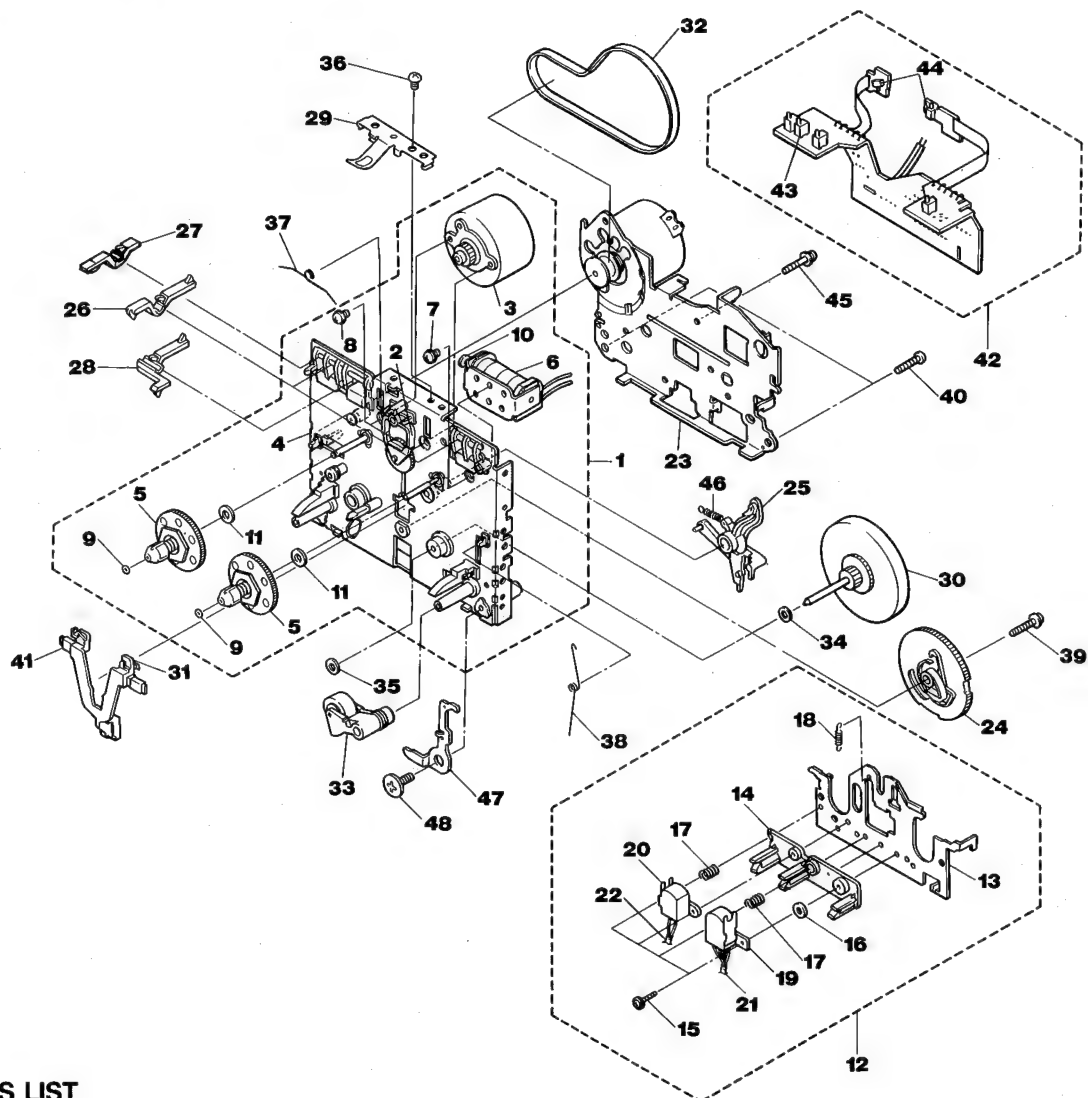
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	F511-454	CHASSIS ASS'Y	25	FD38M-22	PLAY ARM ASS'Y
2	F517-049	IDLER ASS'Y	26	FD38S-21	SWITCH ARM, REC
3	F564-258	REEL MOTOR	27	FD38T-12B	SWITCH ARM, PACK
4	F612-109	CHASSIS BASE ASS'Y	28	FD38U-12	SWITCH ARM, METAL
5	F623-037	REEL BASE ASS'Y	29	FC40N-32	SPRING, CASSETTE
6	F765-252	SOLENOID ASS'Y	30	FR19V-22C	FLYWHEEL ASS'Y
7	FG114-15	SCREW (2.6 x 4 mm)	31	FD36H-12	HOLD LEVER
8	FG114-20	SCREW (2.6 x 6 mm)	32	FF16K-11	MAIN BELT
9	FJ111-17	NON-METAL WASHER (1.7 x 0.25 mm)	33	FR20L-21A	PINCH ROLLER
10	PL366-11	PLUNGER	34	FJ111-30	NON-METAL WASHER (2.6 x 0.25 mm)
11	UJ12V-11	NON-METAL WASHER (2.1 x 0.25 mm)	35	FJ141-11A	OIL SEAL (2.4 x 0.25 mm)
12	F513-604	PLATE HEAD ASS'Y	36	KG194-11	SCREW (3.0 x 5 mm)
13	FC38N-D4	HEAD BASE	37	FK22E-11	HOLD SPRING
14	FD33C-11	HEAD SPACER	38	FK22V-15	EJECT PREVENTION SPRING
15	FG137-18	SCREW (2 x 9 mm)	39	UG17L-11	SCREW (2 x 15 mm)
16	FJ111-18	NON-METAL WASHER (2.1 x 0.25mm)	40	UG12H-14	SCREW (2.6 x 8 mm)
17	FK21U-11	SPRING, AZIMUTH	41	FF16N-13	RUBBER BRAKE
18	FK22L-11A	HEAD BASE SPRING	42	F567-381	RELAY P. C. BOARD ASS'Y
19	FU18K-13	REC/PB HEAD	43	UE16E-11	PUSH SWITCH
20	FU192-11	ERASE HEAD	44	AZ15S-00	LEAF SWITCH
21	WH50S-06	WIRE CONNECTOR	45	UG17H-11	SCREW (2.6 x 23.5 mm)
22	WH42S-00	WIRE CONNECTOR	46	FK22G-14	PLAY ARM SPRING
23	F525-185	CAPSTAN MOTOR ASS'Y	47	FC39M-68	EJECT PREVENTION ARM
24	FD39C-54	CAM GEAR	48	UG15S-11A	SCREW (7.7mm)



### PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4500A	FRONT PANEL ASS'Y UA I
AAA	A442-TD4500B	FRONT PANEL ASS'Y BK IB BB
137	1442- 24408	PANEL UA I
137A	1442- 24405	PANEL BK IB BB
138	1511-19807	PLATE
142	1532- 17505	WINDOW
153	1662- 52303	PUSH BUTTON UA I
153A	1662- 52301	PUSH BUTTON BK IB BB
156	1662- 58502	PUSH BUTTON UA I
156A	1662-58501	PUSH BUTTON BK IB BB
157	1662- 52204	PUSH BUTTON UA I
157A	1662- 52203	PUSH BUTTON BK IB BB
163	2219-8284	METAL FITTING
171	2240-7370	HOLDER
188	2216-7195	SHIELD PLATE
195	2347-R0126082	SCREW (2.6X8mm)

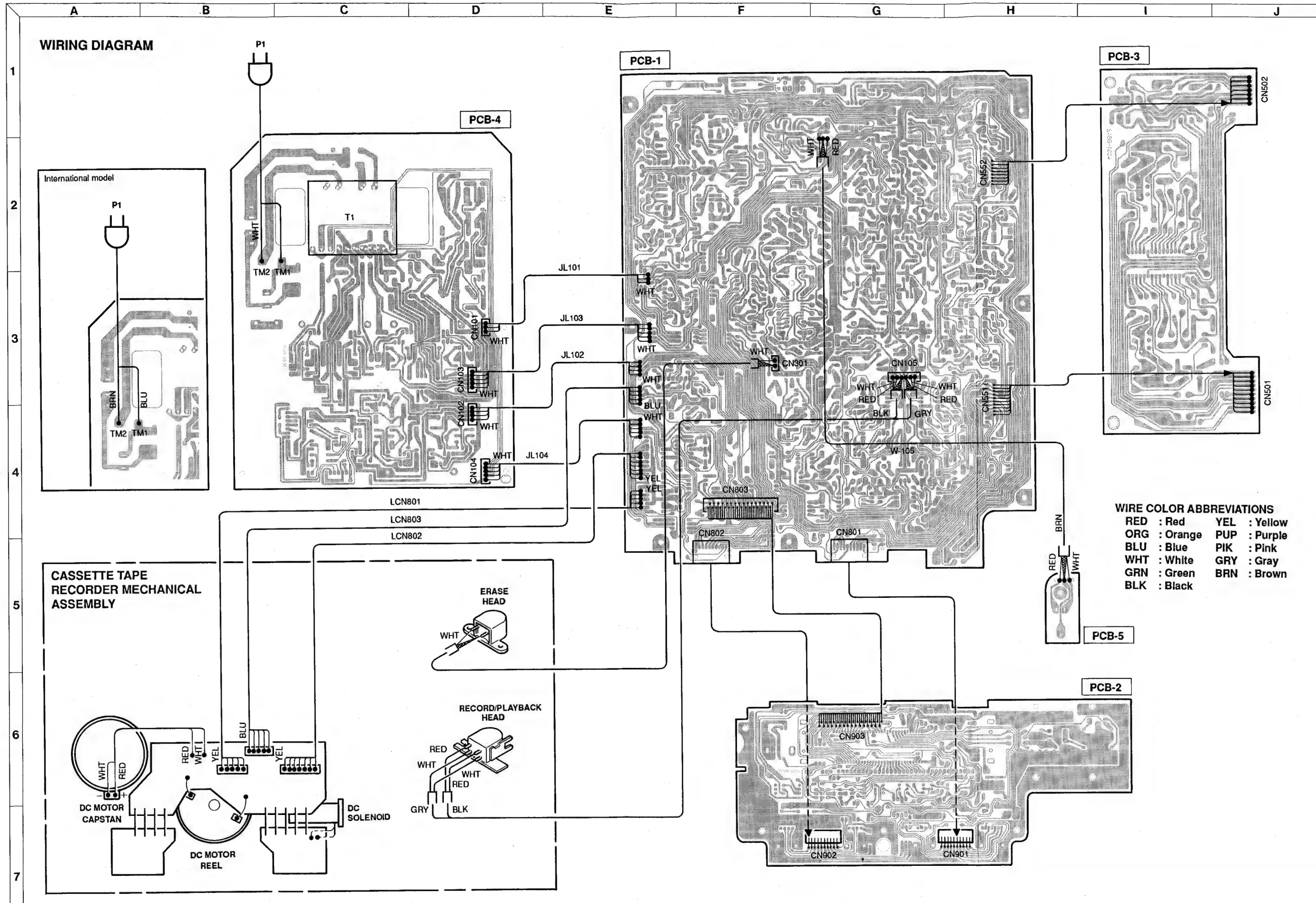
# **CASSETTE TAPE RECORDER MECHANISM** **EXPLODED VIEW**



## **PARTS LIST**

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	F511-454	CHASSIS ASS'Y	25	FD38M-22	PLAY ARM ASS'Y
2	F517-049	IDLER ASS'Y	26	FD38S-21	SWITCH ARM, REC
3	F564-258	REEL MOTOR	27	FD38T-12B	SWITCH ARM, PACK
4	F612-109	CHASSIS BASE ASS'Y	28	FD38U-12	SWITCH ARM, METAL
5	F623-037	REEL BASE ASS'Y	29	FC40N-32	SPRING, CASSETTE
6	F765-252	SOLENOID ASS'Y	30	FR19V-22C	FLYWHEEL ASS'Y
7	FG114-15	SCREW (2.6 x 4 mm)	31	FD36H-12	HOLD LEVER
8	FG114-20	SCREW (2.6 x 6 mm)	32	FF16K-11	MAIN BELT
9	FJ111-17	NON-METAL WASHER (1.7 x 0.25 mm)	33	FR20L-21A	PINCH ROLLER
10	PL366-11	PLUNGER	34	FJ111-30	NON-METAL WASHER (2.6 x 0.25 mm)
11	UJ12V-11	NON-METAL WASHER (2.1 x 0.25 mm)	35	FJ141-11A	OIL SEAL (2.4 x 0.25 mm)
12	F513-604	PLATE HEAD ASS'Y	36	KG194-11	SCREW (3.0 x 5 mm)
13	FC38N-D4	HEAD BASE	37	FK22E-11	HOLD SPRING
14	FD33C-11	HEAD SPACER	38	FK22V-15	EJECT PREVENTION SPRING
15	FG137-18	SCREW (2 x 9 mm)	39	UG17L-11	SCREW (2 x 15 mm)
16	FJ111-18	NON-METAL WASHER (2.1 x 0.25mm)	40	UG12H-14	SCREW (2.6 x 8 mm)
17	FK21U-11	SPRING, AZIMUTH	41	FF16N-13	RUBBER BRAKE
18	FK22L-11A	HEAD BASE SPRING	42	F567-381	RELAY P. C. BOARD ASS'Y
19	FU18K-13	REC/PB HEAD	43	UE16E-11	PUSH SWITCH
20	FU192-11	ERASE HEAD	44	AZ15S-00	LEAF SWITCH
21	WH50S-06	WIRE CONNECTOR	45	UG17H-11	SCREW (2.6 x 23.5 mm)
22	WH42S-00	WIRE CONNECTOR	46	FK22G-14	PLAY ARM SPRING
23	F525-185	CAPSTAN MOTOR ASS'Y	47	FC39M-68	EJECT PREVENTION ARM
24	FD39C-54	CAM GEAR	48	UG15S-11A	SCREW (7.7mm)





# WIRING DIAGRAM

International model

P1



BRN

BLU

TM2

TM1

P1



WHT

TM2

TM1

T1

PCB-4

JL101

JL103

JL102

JL104

LCN801

LCN803

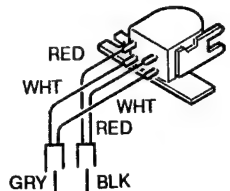
LCN802

## CASSETTE TAPE RECORDER MECHANICAL ASSEMBLY

ERASE HEAD



RECORD/PLAYBACK HEAD



DC MOTOR CAPSTAN

DC SOLENOID

DC MOTOR REEL

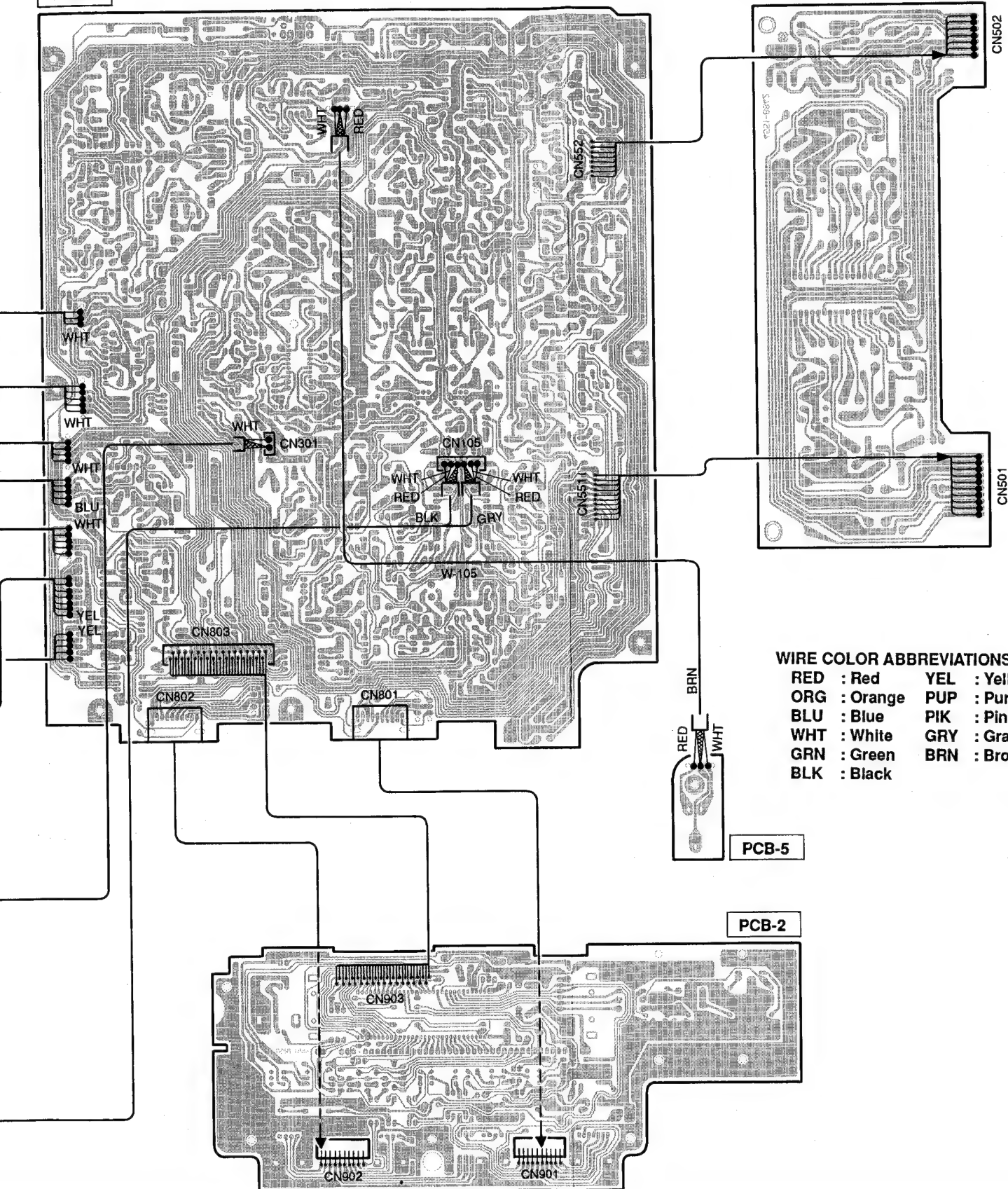
PCB-1



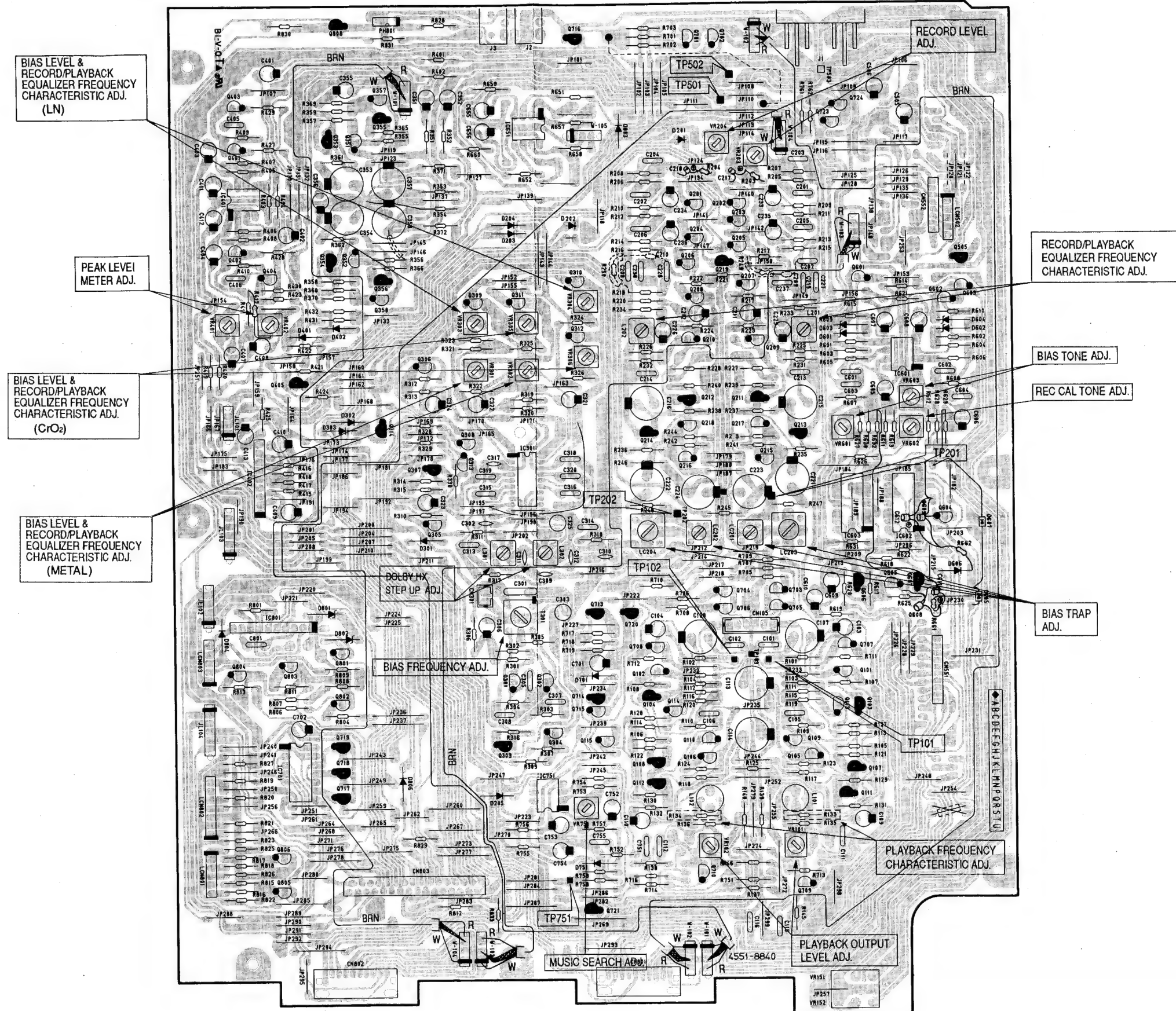
E F G H I J

PCB-1

PCB-3



PCB-1	Main P. C. Board
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## P. C. BOARDS (1)

## PCB-1 Main P. C. Board

BIAS LEVEL &  
RECORD/PLAYBACK  
EQUALIZER FREQUENCY  
CHARACTERISTIC ADJ.  
(LN)

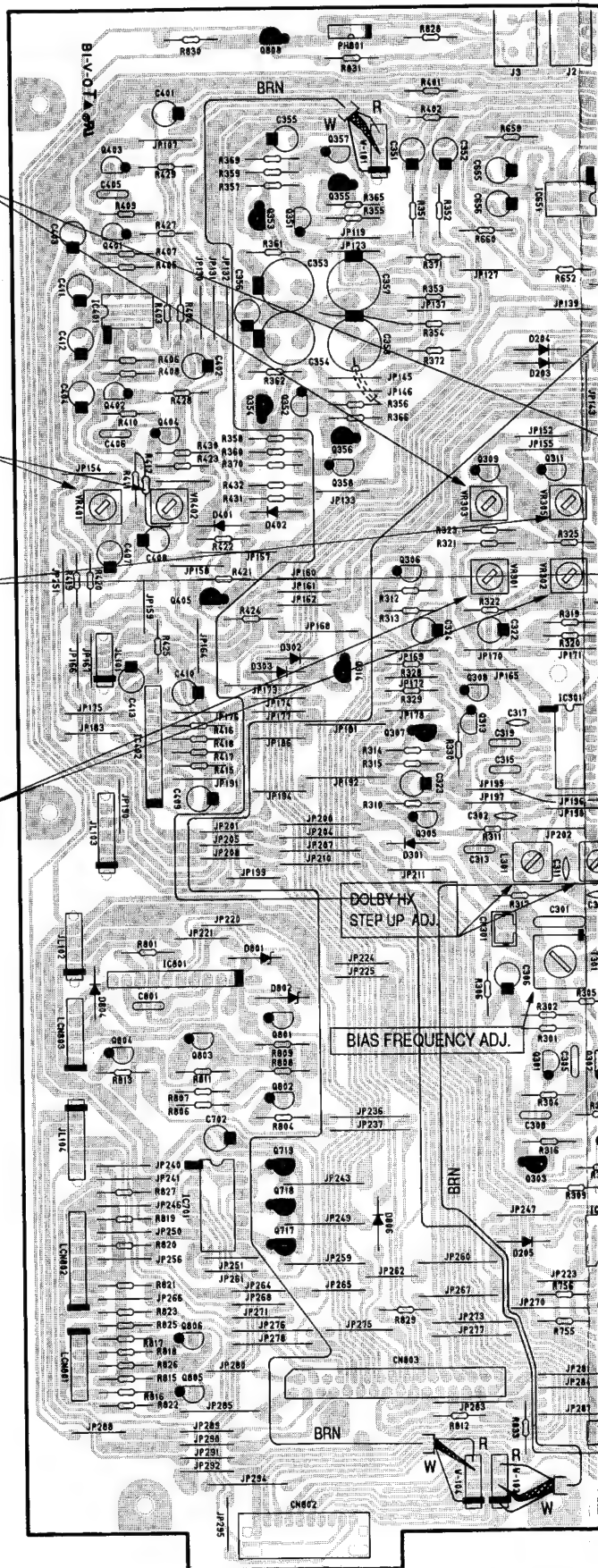
PEAK LEVEL  
METER ADJ.

BIAS LEVEL &  
RECORD/PLAYBACK  
EQUALIZER FREQUENCY  
CHARACTERISTIC ADJ.  
(CrO<sub>2</sub>)

BIAS LEVEL &  
RECORD/PLAYBACK  
EQUALIZER FREQUENCY  
CHARACTERISTIC ADJ.  
(METAL)

DOLBY HX  
STEP UP ADJ.

BIAS FREQUENCY ADJ.



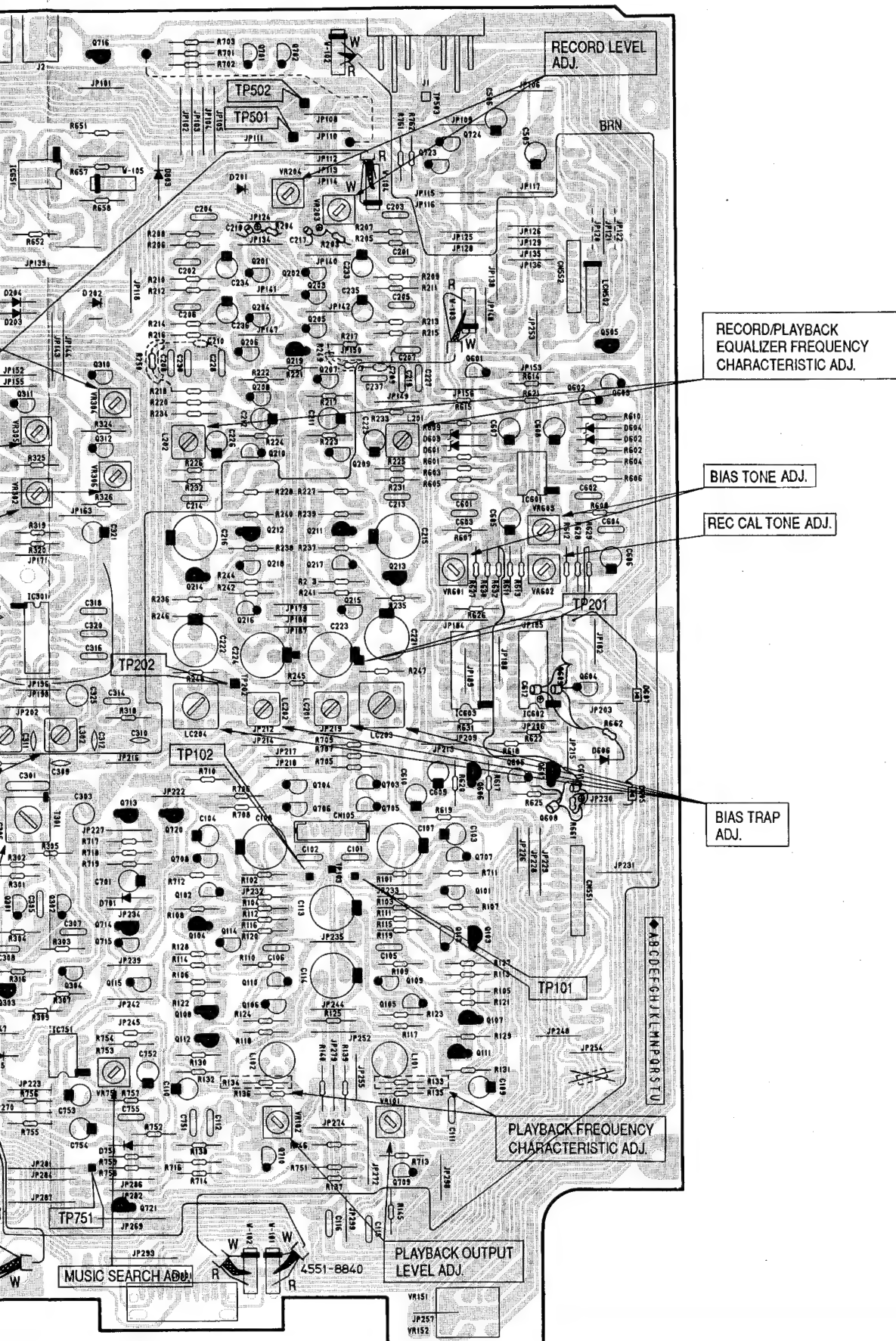
F

G

H

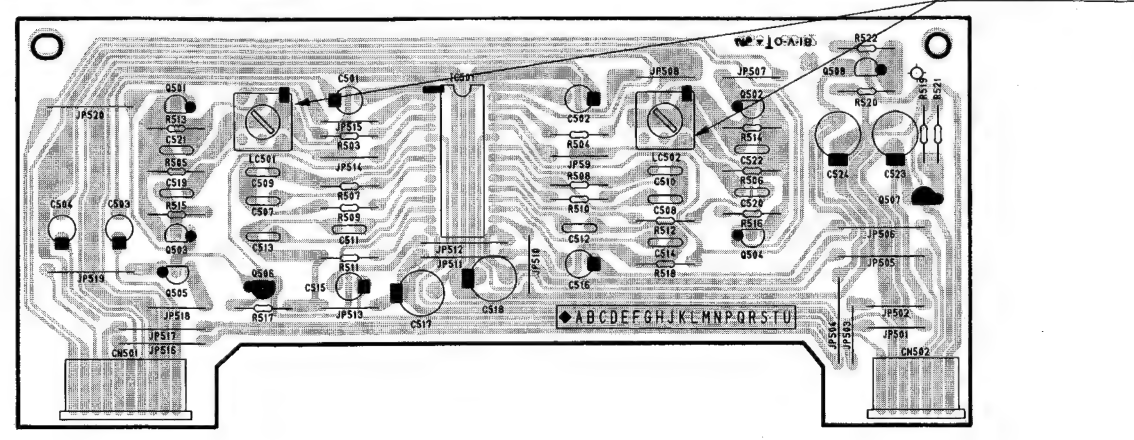
I

J

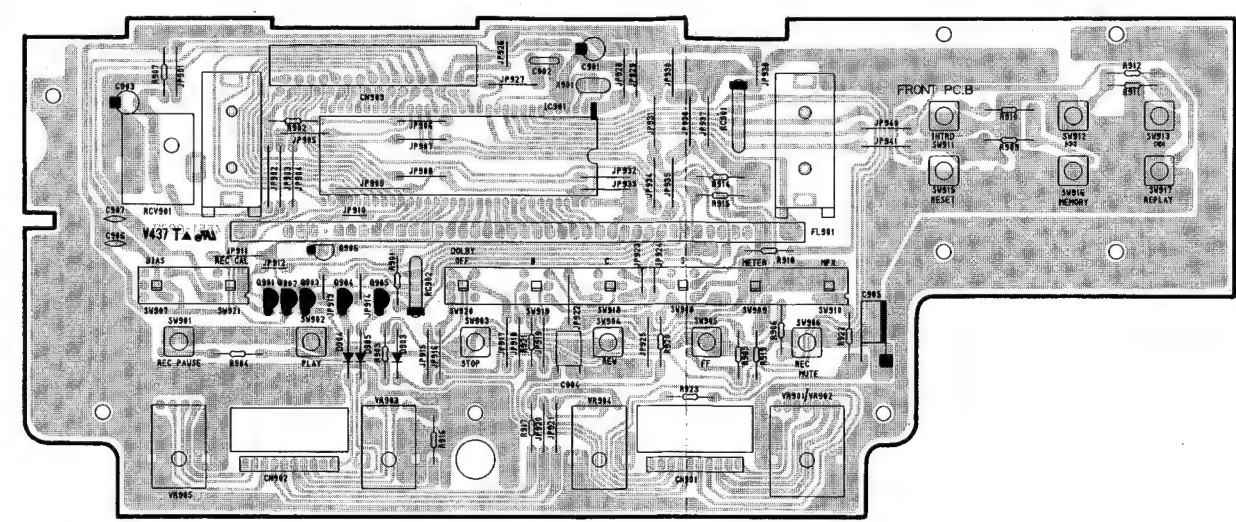


P. C. BOARDS (2)

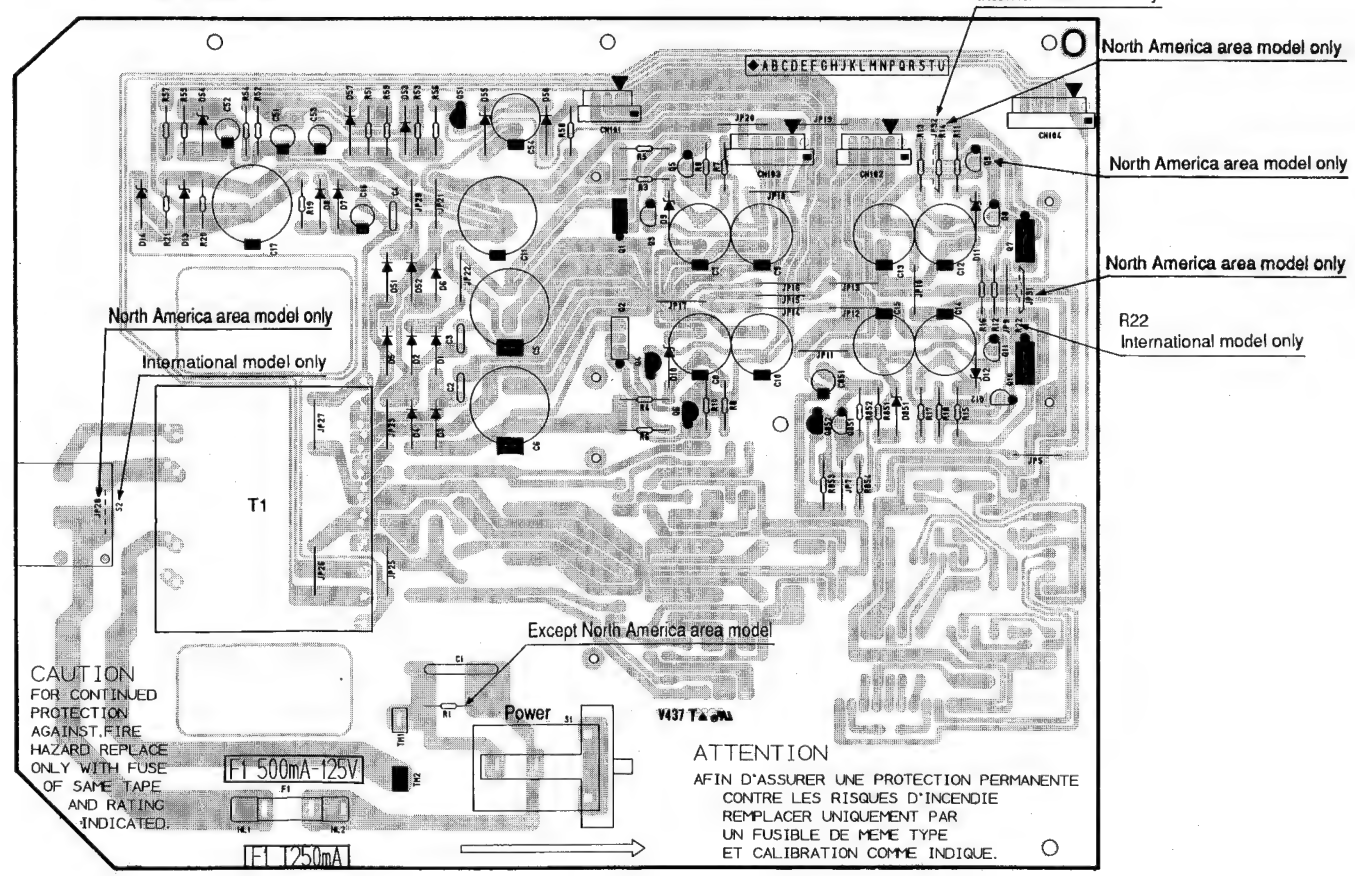
PCB-3  
Dolby B/C NR P. C. Board



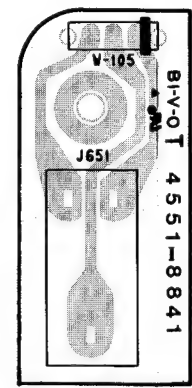
PCB-2  
Front P. C. Board



PCB-4  
Power P. C. Board



PCB-5  
Headphone P. C. Board

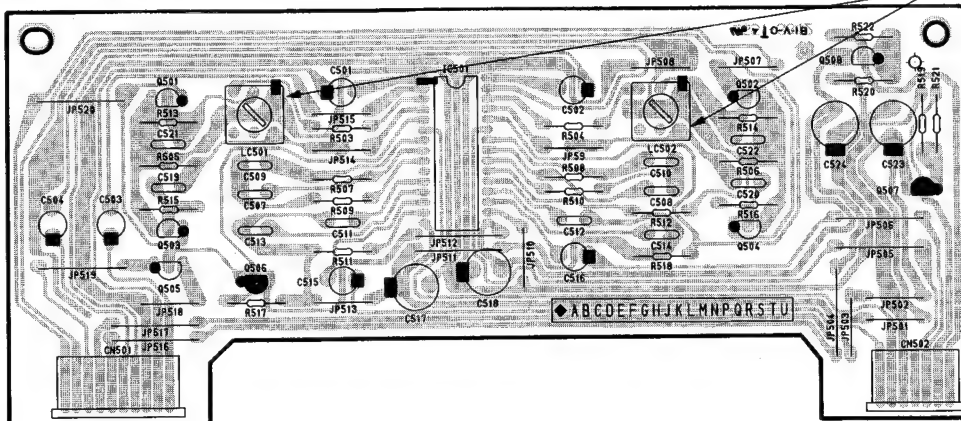




	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
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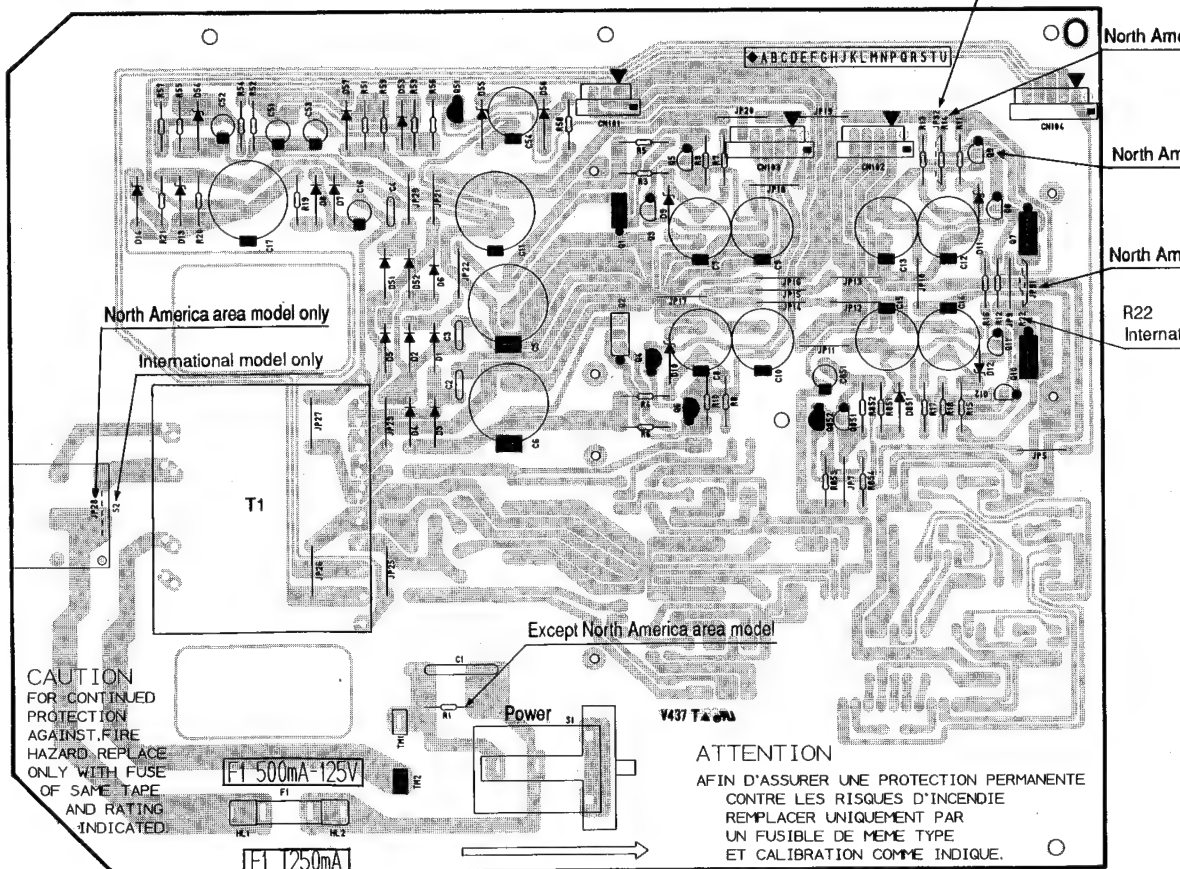
1	
2	
3	
4	
5	
6	
7	

MPX FILTER  
CHARACTERISTIC ADJ.



4	
5	
6	
7	

JP32  
International model only





## ELECTRICAL PARTS LIST

Ser.No.	Ref.No.	Part No.	Description	Ser.No.	Ref.No.	Part No.	Description	Ser.No.	Ref.No.	Part No.	Description	Ser.No.	Ref.No.	Part No.	Description
PCB-1 MAIN P. C. BOARD															
CAPACITORS															
427	C101	5359-4715851	CAP,PPP 470P	916	C354	5345-107B0951	CAP,MINI ELE 100μ/10V	451	R136	5135-221522	RES,CBN 1/2P 220	575	R328	5135-471522	RES,CBN 1/2P 470
427	C102	5359-4715851	CAP,PPP 470P	916	C355	5345-107B0951	CAP,MINI ELE 100μ/10V	453	R137	5135-104522	RES,CBN 1/2P 100K	576	R329	5135-123522	RES,CBN 1/2P 12K
415	C103	5345-106C0951	CAP,MINI ELE 10μ/16V	916	C356	5345-107B0951	CAP,MINI ELE 100μ/10V	453	R138	5135-104522	RES,CBN 1/2P 100K	576	R330	5135-123522	RES,CBN 1/2P 12K
415	C104	5345-106C0951	CAP,MINI ELE 10μ/16V	917	C357	5345-227C041	CAP,MINI ELE 220μ/16V	431	R139	5135-121522	RES,CBN 1/2P 120	919	R351	5135-102522	RES,CBN 1/2P 1K
423	C105	5359-8225851	CAP,PPP 8200P	917	C358	5345-227C041	CAP,MINI ELE 220μ/16V	431	R140	5135-121522	RES,CBN 1/2P 120	919	R352	5135-102522	RES,CBN 1/2P 1K
423	C106	5359-8225851	CAP,PPP 8200P	714	C401	5345-105F041	CAP,MINI ELE 1μ/50V	454	R145	5135-102522	RES,CBN 1/2P 1K	920	R353	5135-473522	RES,CBN 1/2P 47K
416	C107	5345-337A0952	CAP,MINI ELE 330μ/6.3V	714	C402	5345-105F041	CAP,MINI ELE 1μ/50V	454	R146	5135-102522	RES,CBN 1/2P 1K	920	R354	5135-473522	RES,CBN 1/2P 47K
416	C108	5345-337A0952	CAP,MINI ELE 330μ/6.3V	712	C403	5345-475F041	CAP,MINI ELE 4.7μ/50V	497	R203	5135-222522	RES,CBN 1/2P 2.2K	921	R355	5135-182522	RES,CBN 1/2P 1.8K
415	C109	5345-106C0951	CAP,MINI ELE 10μ/16V	712	C404	5345-475F041	CAP,MINI ELE 4.7μ/50V	497	R204	5135-222522	RES,CBN 1/2P 2.2K	921	R356	5135-182522	RES,CBN 1/2P 1.8K
415	C110	5345-106C0951	CAP,MINI ELE 10μ/16V	716	C405	5359-S010J222	CAP,PPP 2200P	498	R205	5135-104522	RES,CBN 1/2P 100K	922	R357	5135-101522	RES,CBN 1/2P 100
424	C111	5359-1825851	CAP,PPP 1800P	716	C406	5359-S010J222	CAP,PPP 2200P	498	R206	5135-104522	RES,CBN 1/2P 100K	922	R358	5135-101522	RES,CBN 1/2P 100
424	C112	5359-1825851	CAP,PPP 1800P	712	C407	5345-475F041	CAP,MINI ELE 4.7μ/50V	499	R207	5135-223522	RES,CBN 1/2P 22K	923	R359	5135-622522	RES,CBN 1/2P 6.2K
420	C113	5345-477C041	CAP,MINI ELE 470μ/16V	712	C408	5345-475F041	CAP,MINI ELE 4.7μ/50V	499	R208	5135-223522	RES,CBN 1/2P 22K	923	R360	5135-622522	RES,CBN 1/2P 6.2K
420	C114	5345-477C041	CAP,MINI ELE 470μ/16V	712	C409	5345-475F041	CAP,MINI ELE 4.7μ/50V	500	R209	5135-392522	RES,CBN 1/2P 3.9K	924	R361	5135-272522	RES,CBN 1/2P 2.7K
425	C115	5359-1225851	CAP,PPP 1200P	712	C410	5345-475F041	CAP,MINI ELE 4.7μ/50V	500	R210	5135-392522	RES,CBN 1/2P 3.9K	924	R362	5135-272522	RES,CBN 1/2P 2.7K
425	C116	5359-1225851	CAP,PPP 1200P	712	C411	5345-226D041	CAP,MINI ELE 22μ/25V	501	R211	5135-272522	RES,CBN 1/2P 2.7K	922	R365	5135-101522	RES,CBN 1/2P 100
485	C201	5359-S010J152	CAP,PPP 1500P	715	C412	5345-226D041	CAP,MINI ELE 22μ/25V	501	R212	5135-272522	RES,CBN 1/2P 2.7K	922	R366	5135-101522	RES,CBN 1/2P 100
485	C202	5359-S010J152	CAP,PPP 1500P	713	C413	5345-476C041	CAP,MINI ELE 47μ/16V	502	R213	5135-183522	RES,CBN 1/2P 18K	926	R369	5135-331522	RES,CBN 1/2P 330
484	C203	5359-S010J122	CAP,PPP 1200P	650	C505	5345-106C0951	CAP,MINI ELE 10μ/16V	502	R214	5135-183522	RES,CBN 1/2P 18K	926	R370	5135-331522	RES,CBN 1/2P 330
484	C204	5359-S010J122	CAP,PPP 1200P	650	C506	5345-106C0951	CAP,MINI ELE 10μ/16V	503	R215	5135-123522	RES,CBN 1/2P 12K	927	R371	5135-220522	RES,CBN 1/2P 22
486	C205	5359-S010J273	CAP,PPP 0.027	952	C601	5354-393J1HM	CAP,MYL .039μ	503	R216	5135-123522	RES,CBN 1/2P 12K	927	R372	5135-220522	RES,CBN 1/2P 22
486	C206	5359-S010J273	CAP,PPP 0.027	953	C602	5359-S010J122	CAP,PPP 1200P	504	R217	5135-471522	RES,CBN 1/2P 470	719	R401	5135-472522	RES,CBN 1/2P 4.7K
487	C207	5359-S010J562	CAP,PPP 5600P	952	C603	5354-393J1HM	CAP,MYL .039μ	504	R218	5135-471522	RES,CBN 1/2P 470	719	R402	5135-472522	RES,CBN 1/2P 4.7K
487	C208	5359-S010J562	CAP,PPP 5600P	953	C604	5359-S010J122	CAP,PPP 1200P	505	R219	5135-222522	RES,CBN 1/2P 2.2K	720	R403	5135-103522	RES,CBN 1/2P 10K
488	C209	5359-S010J222	CAP,PPP 2200P	955	C605	5345-105F041	CAP,MINI ELE 1μ/50V	505	R220	5135-222522	RES,CBN 1/2P 2.2K	720	R404	5135-103522	RES,CBN 1/2P 10K
488	C210	5359-S010J222	CAP,PPP 2200P	955	C606	5345-105F041	CAP,MINI ELE 1μ/50V	506	R221	5135-472522	RES,CBN 1/2P 4.7K	721	R405	5135-104522	RES,CBN 1/2P 100K
476	C211	5345-105F0951	CAP,MINI ELE 1μ/50V	956	C607	5345-476C041	CAP,MINI ELE 47μ/16V	506	R222	5135-472522	RES,CBN 1/2P 4.7K	721	R406	5135-104522	RES,CBN 1/2P 100K
476	C212	5345-105F0951	CAP,MINI ELE 1μ/50V	956	C608	5345-476C041	CAP,MINI ELE 47μ/16V	507	R223	5135-104522	RES,CBN 1/2P 100K	723	R407	5135-222522	RES,CBN 1/2P 2.2K
491	C213	5359-S010J123	CAP,PPP .012μ	956	C609	5345-476C041	CAP,MINI ELE 47μ/16V	507	R224	5135-104522	RES,CBN 1/2P 100K	723	R408	5135-222522	RES,CBN 1/2P 2.2K
491	C214	5359-S010J123	CAP,PPP .012μ	956	C610	5345-476C041	CAP,MINI ELE 47μ/16V	508	R225	5135-181522	RES,CBN 1/2P 180	724	R409	5135-273522	RES,CBN 1/2P 27K
477	C215	5345-476C0951	CAP,MINI ELE 47μ/16V	956	C611	5345-106C041	CAP,MINI ELE 10μ/16V	508	R226	5135-181522	RES,CBN 1/2P 180	724	R410	5135-273522	RES,CBN 1/2P 27K
477	C216	5345-476C0951	CAP,MINI ELE 47μ/16V	934	C612	5345-106C041	CAP,MINI ELE 10μ/16V	510	R227	5135-122522	RES,CBN 1/2P 1.2K	725	R411	5135-223522	RES,CBN 1/2P 22K
482	C217	5345-225F0951	CAP,MINI ELE 2.2μ/50V	934	C655	5345-476C041	CAP,MINI ELE 47μ/16V	510	R228	5135-122522	RES,CBN 1/2P 1.2K	725	R412	5135-223522	RES,CBN 1/2P 22K
482	C218	5345-225F0951	CAP,MINI ELE 2.2μ/50V	934	C656	5345-476C041	CAP,MINI ELE 47μ/16V	509	R231	5135-821522	RES,CBN 1/2P 820	726	R415	5135-334522	RES,CBN 1/2P 330K
480	C221	5345-227B0952	CAP,MINI ELE 220μ/10V	683	C701	5345-106F041	CAP,MINI ELE 10μ/50V	509	R232	5135-821522	RES,CBN 1/2P 820	726	R416	5135-334522	RES,CBN 1/2P 330K
480	C222	5345-227B0952	CAP,MINI ELE 220μ/10V	893	C751	5354-473J1HM	CAP,MYL .047μ	515	R233	5135-272522	RES,CBN 1/2P 2.7K	720	R417	5135-103522	RES,CBN 1/2P 10K
481	C223	5345-227C041	CAP,MINI ELE 220μ/16V	891	C752	5345-476C041	CAP,MINI ELE 47μ/16V	515	R234	5135-272522	RES,CBN 1/2P 2.7K				



## ELECTRICAL PARTS LIST

Ser.No.	Ref.No.	Part No.	Description
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## PCB-1 MAIN P. C. BOARD

## CAPACITORS

427	C101	5359-4715851	CAP,PPP 470P
427	C102	5359-4715851	CAP,PPP 470P
415	C103	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
415	C104	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
423	C105	5359-8225851	CAP,PPP 8200P
423	C106	5359-8225851	CAP,PPP 8200P
416	C107	5345-337A0952	CAP,MINI ELE 330 $\mu$ /6.3V
416	C108	5345-337A0952	CAP,MINI ELE 330 $\mu$ /6.3V
415	C109	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
415	C110	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
424	C111	5359-1825851	CAP,PPP 1800P
424	C112	5359-1825851	CAP,PPP 1800P
420	C113	5345-477C041	CAP,MINI ELE 470 $\mu$ /16V
420	C114	5345-477C041	CAP,MINI ELE 470 $\mu$ /16V
425	C115	5359-1225851	CAP,PPP 1200P
425	C116	5359-1225851	CAP,PPP 1200P
485	C201	5359-S010J152	CAP,PPP 1500P
485	C202	5359-S010J152	CAP,PPP 1500P
484	C203	5359-S010J122	CAP,PPP 1200P
484	C204	5359-S010J122	CAP,PPP 1200P
486	C205	5359-S010J273	CAP,PPP 0.027
486	C206	5359-S010J273	CAP,PPP 0.027
487	C207	5359-S010J562	CAP,PPP 5600P
487	C208	5359-S010J562	CAP,PPP 5600P
488	C209	5359-S010J222	CAP,PPP 2200P
488	C210	5359-S010J222	CAP,PPP 2200P
476	C211	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
476	C212	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
491	C213	5359-S010J123	CAP,PPP .012 $\mu$
491	C214	5359-S010J123	CAP,PPP .012 $\mu$
477	C215	5345-476C0951	CAP,MINI ELE 47 $\mu$ /16V
477	C216	5345-476C0951	CAP,MINI ELE 47 $\mu$ /16V
482	C217	5345-225F0951	CAP,MINI ELE 2.2 $\mu$ /50V
482	C218	5345-225F0951	CAP,MINI ELE 2.2 $\mu$ /50V
480	C221	5345-227B0952	CAP,MINI ELE 220 $\mu$ /10V
480	C222	5345-227B0952	CAP,MINI ELE 220 $\mu$ /10V
481	C223	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V
481	C224	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V
479	C225	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
479	C226	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
489	C227	5359-S010J472	CAP,PPP 4700P
489	C228	5359-S010J472	CAP,PPP 4700P
483	C233	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
483	C234	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
475	C235	5345-104F0951	CAP,MINI ELE 0.1 $\mu$ /50V
475	C236	5345-104F0951	CAP,MINI ELE 0.1 $\mu$ /50V
490	C237	5359-S010J222	CAP,PPP 2200P
490	C238	5359-S010J222	CAP,PPP 2200P
547	C301	5354-S040K103	CAP,MYL .01 $\mu$
556	C302	5361-100J434	CAP,CER 10P
542	C303	5342-106D041	CAP,ELE BP 10 $\mu$ /25V
551	C305	5359-S010J153	CAP,PPP .015 $\mu$
543	C306	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
552	C307	5359-S010J332	CAP,PPP 3300P
552	C308	5359-S010J332	CAP,PPP 3300P
557	C309	5361-1010423	CAP,CER 100P
557	C310	5361-1010423	CAP,CER 100P
558	C311	5361-4710423	CAP,CER 470P
558	C312	5361-4710423	CAP,CER 470P
559	C313	5359-S010J561	CAP,PPP 560P
559	C314	5359-S010J561	CAP,PPP 560P
548	C315	5354-104593	CAP,MYL .1 $\mu$
548	C316	5354-104593	CAP,MYL .1 $\mu$
553	C317	5359-S010J103	CAP,PPP .01 $\mu$
553	C318	5359-S010J103	CAP,PPP .01 $\mu$
554	C319	5359-S010J223	CAP,PPP .022 $\mu$
554	C320	5359-S010J223	CAP,PPP .022 $\mu$
543	C321	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
543	C322	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
543	C323	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
543	C324	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
542	C325	5342-106D041	CAP,ELE BP 10 $\mu$ /25V
914	C351	5345-225F0951	CAP,MINI ELE 2.2 $\mu$ /50V
914	C352	5345-225F0951	CAP,MINI ELE 2.2 $\mu$ /50V
916	C353	5345-107B0951	CAP,MINI ELE 100 $\mu$ /10V

Ser.No.	Ref.No.	Part No.	Description
916	C354	5345-107B0951	CAP,MINI ELE 100 $\mu$ /10V
916	C355	5345-107B0951	CAP,MINI ELE 100 $\mu$ /10V
916	C356	5345-107B0951	CAP,MINI ELE 100 $\mu$ /10V
917	C357	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V
917	C358	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V
714	C401	5345-105F041	CAP,MINI ELE 1 $\mu$ /50V
714	C402	5345-105F041	CAP,MINI ELE 1 $\mu$ /50V
712	C403	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
712	C404	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
716	C405	5359-S010J222	CAP,PPP 2200P
716	C406	5359-S010J222	CAP,PPP 2200P
712	C407	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
712	C408	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
712	C409	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
712	C410	5345-475F041	CAP,MINI ELE 4.7 $\mu$ /50V
715	C411	5345-226D041	CAP,MINI ELE 22 $\mu$ /25V
715	C412	5345-226D041	CAP,MINI ELE 22 $\mu$ /25V
713	C413	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
650	C505	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
650	C506	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
952	C601	5354-393JIHM	CAP,MYL .039 $\mu$
953	C602	5359-S010J122	CAP,PPP 1200P
952	C603	5354-393JIHM	CAP,MYL .039 $\mu$
953	C604	5359-S010J122	CAP,PPP 1200P
955	C605	5345-105F041	CAP,MINI ELE 1 $\mu$ /50V
955	C606	5345-105F041	CAP,MINI ELE 1 $\mu$ /50V
956	C607	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
956	C608	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
956	C609	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
956	C610	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
	C611	5345-106C041	CAP,MINI ELE 10 $\mu$ /16V
	C612	5345-106C041	CAP,MINI ELE 10 $\mu$ /16V
934	C655	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
934	C656	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
683	C701	5345-106F041	CAP,MINI ELE 10 $\mu$ /50V
683	C702	5345-106F041	CAP,MINI ELE 10 $\mu$ /50V
893	C751	5354-473JIHM	CAP,MYL .047 $\mu$
891	C752	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
891	C753	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
891	C754	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
894	C755	5359-S010J822	CAP,PPP 8200P
867	C801	5359-S010J103	CAP,PPP .01 $\mu$

## RESISTORS

434	R101	5135-470522	RES,CBN 1/2P 47
434	R102	5135-470522	RES,CBN 1/2P 47
435	R103	5135-124522	RES,CBN 1/2P 120K
435	R104	5135-124522	RES,CBN 1/2P 120K
436	R105	5135-272522	RES,CBN 1/2P 2.7K
436	R106	5135-272522	RES,CBN 1/2P 2.7K
437	R107	5135-470522	RES,CBN 1/2P 47
437	R108	5135-470522	RES,CBN 1/2P 47
438	R109	5135-394522	RES,CBN 1/2P 390K
438	R110	5135-394522	RES,CBN 1/2P 390K
439	R111	5135-820522	RES,CBN 1/2P 82
439	R112	5135-820522	RES,CBN 1/2P 82
441	R113	5135-124522	RES,CBN 1/2P 120K
441	R114	5135-124522	RES,CBN 1/2P 120K
442	R115	5135-153522	RES,CBN 1/2P 15K
442	R116	5135-153522	RES,CBN 1/2P 15K
443	R117	5135-473522	RES,CBN 1/2P 47K
443	R118	5135-473522	RES,CBN 1/2P 47K
444	R119	5135-203522	RES,CBN 1/2P 20K
444	R120	5135-203522	RES,CBN 1/2P 20K
445	R121	5135-271522	RES,CBN 1/2P 270
445	R122	5135-271522	RES,CBN 1/2P 270
446	R123	5135-820522	RES,CBN 1/2P 82
446	R124	5135-820522	RES,CBN 1/2P 82
447	R125	5135-473522	RES,CBN 1/2P 47K
448	R127	5135-105522	RES,CBN 1/2P 1M
448	R128	5135-105522	RES,CBN 1/2P 1M
449	R129	5135-332522	RES,CBN 1/2P 3.3K
449	R130	5135-332522	RES,CBN 1/2P 3.3K
450	R131	5135-471522	RES,CBN 1/2P 470
450	R132	5135-471522	RES,CBN 1/2P 470
451	R133	5135-221522	RES,CBN 1/2P 220
451	R134	5135-221522	RES,CBN 1/2P 220
451	R135	5135-221522	RES,CBN 1/2P 220

Ser.No.	Ref.No.	Part No.	Description
451	R136	5135-221522	RES,CBN 1/2P 220
453	R137	5135-104522	RES,CBN 1/2P 100K
453	R138	5135-104522	RES,CBN 1/2P 100K
431	R139	5135-121522	RES,CBN 1/2P 120
431	R140	5135-121522	RES,CBN 1/2P 120
454	R145	5135-102522	RES,CBN 1/2P 1K
454	R146	5135-102522	RES,CBN 1/2P 1K
497	R203	5135-222522	RES,CBN 1/2P 2.2K
497	R204	5135-222522	RES,CBN 1/2P 2.2K
498	R205	5135-104522	RES,CBN 1/2P 100K
498	R206	5135-104522	RES,CBN 1/2P 100K
499	R207	5135-223522	RES,CBN 1/2P 22K
499	R208	5135-223522	RES,CBN 1/2P 22K
500	R209	5135-392522	RES,CBN 1/2P 3.9K
500	R210	5135-392522	RES,CBN 1/2P 3.9K
501	R211	5135-272522	RES,CBN 1/2P 2.7K
501	R212	5135-272522	RES,CBN 1/2P 2.7K
502	R213	5135-183522	RES,CBN 1/2P 18K
502	R214	5135-183522	RES,CBN 1/2P 18K
503	R215	5135-123522	RES,CBN 1/2P 12K
503	R216	5135-123522	RES,CBN 1/2P 12K
504	R217	5135-471522	RES,CBN 1/2P 470
504	R218	5135-471522	RES,CBN 1/2P 470
505	R219	5135-222522	RES,CBN 1/2P 2.2K
505	R220	5135-222522	RES,CBN 1/2P 2.2K
506	R221	5135-472522	RES,CBN 1/2P 4.7K
506	R222	5135-472522	RES,CBN 1/2P 4.7K
507	R223	5135-104522	RES,CBN 1/2P 100K
507	R224	5135-104522	RES,CBN 1/2P 100K
508	R225	5135-181522	RES,CBN 1/2P 180
508	R226	5135-181522	RES,CBN 1/2P 180
510	R227	5135-122522	RES,CBN 1/2P 1.2K
510	R228	5135-122522	RES,CBN 1/2P 1.2K
509	R231	5135-821522	RES,CBN 1/2P 820
509	R232	5135-821522	RES,CBN 1/2P 820
515	R233	5135-272522	RES,CBN 1/2P 2.7K
515	R234	5135-272522	RES,CBN 1/2P 2.7K
510	R235	5135-122522	RES,CBN 1/2P 1.2K
510	R236	5135-122522	RES,CBN 1/2P 1.2K
512	R237	5135-104522	RES,CBN 1/2P 100K
512	R238	5135-104522	RES,CBN 1/2P 100K
513	R239	5135-151522	RES,CBN 1/2P 150
513	R240	5135-151522	RES,CBN 1/2P 150
516	R241	5135-820522	RES,CBN 1/2P 82
516	R242	5135-820522	RES,CBN 1/2P 82
495	R243	5135-473522	RES,CBN 1/2P 47K
495	R244	5135-473522	RES,CBN 1/2P 47K
493	△ R245	5102-1014715	RES,FUSE 100
493	△ R246	5102-1014715	RES,FUSE 100
517	R247	5135-331522	RES,CBN 1/2P 330
517	R248	5135-331522	RES,CBN 1/2P 330
518	R249	5135-153522	RES,CBN 1/2P 15K
518	R250	5135-153522	RES,CBN 1/2P 15K
561	R301	5135-5R6522	RES,CBN 1/2P 5.6
561	R302	5135-5R6522	RES,CBN 1/2P 5.6
563	R303	5135-333522	RES,CBN 1/2P 33K
563	R304	5135-333522	RES,CBN 1/2P 33K
569	R305	5135-820522	RES,CBN 1/2P 82
538	△ R306	5102-6804715	RES,FUSE 68
564	R307	5135-103522	RES,CBN 1/2P 10K
564	R309	5135-103522	RES,CBN 1/2P 10K
565	R310	5135-473522	RES,CBN 1/2P 47K
562	R311	5135-220522	RES,CBN 1/2P 22
566	R312	5135-472522	RES,CBN 1/2P 4.7K
567	R313	5135-822522	RES,CBN 1/2P 8.2K
566	R314	5135-472522	RES,CBN 1/2P 4.7K
567	R315	5135-822522	RES,CBN 1/2P 8.2K
564	R316	5135-103522	RES,CBN 1/2P 10K
568	R317	5135-154522	RES,CBN 1/2P 150K
568	R318	5135-154522	RES,CBN 1/2P 150K
571	R319	5135-333522	RES,CBN 1/2P 33K
571	R320	5135-333522	RES,CBN 1/2P 33K
572	R321	5135-102522	RES,CBN 1/2P 1K
572	R322	5135-102522	RES,CBN 1/2P 1K
577	R323	5135-121522	RES,CBN 1/2P 120
577	R324	5135-121522	RES,CBN 1/2P 120
574	R325	5135-561522	RES,CBN 1/2P 560
574	R326	5135-561522	RES,CBN 1/2P 560

Ser.No.	Ref.No.	Part No.	Description
575	R328	5135-471522	RES,CBN 1/2P 470
576	R329	5135-123522	RES,CBN 1/2P 12K
576	R330	5135-123522	RES,CBN 1/2P 12K
919	R351	5135-102522	RES,CBN 1/2P 1K
919	R352	5135-102522	RES,CBN 1/2P 1K
920	R353	5135-473522	RES,CBN 1/2P 47K
920	R354	5135-473522	RES,CBN 1/2P 47K
921	R355	5135-182522	RES,CBN 1/2P 1.8K
921	R356	5135-182522	RES,CBN 1/2P 1.8K
922	R357	5135-101522	RES,CBN 1/2P 100
922	R358	5135-101522	RES,CBN 1/2P 100
923	R359	5135-622522	RES,CBN 1/2P 6.2K
923	R360	5135-622522	RES,CBN 1/2P 6.2K
924	R361	5135-272522	RES,CBN 1/2P 2.7K
924	R362	5135-272522	RES,CBN 1/2P 2.7K
922	R365	5135-101522	RES,CBN 1/2P 100
922	R366	5135-101522	RES,CBN 1/2P 100
926	R369	5135-331522	RES,CBN 1/2P 330
926	R370	5135-331522	RES,CBN 1/2P 330
927	R371	5135-220522	RES,CBN 1/2P 22
927	R372	5135-220522	RES,CBN 1/2P 22
719	R401	5135-472522	RES,CBN 1/2P 4.7K
719	R402	5135-472522	RES,CBN 1/2P 4.7K
720	R403	5135-103522	RES,CBN 1/2P 10K
720	R404	5135-103522	RES,CBN 1/2P 10K
721	R405	5135-104522	RES,CBN 1/2P 100K
721	R406	5135-104522	RES,CBN 1/2P 100K
723	R407	5135-222522	RES,CBN 1/2P 2.2K
723	R408	5135-222522	RES,CBN 1/2P 2.2K
724	R409	5135-273522	RES,CBN 1/2P 27K
724	R410	5135-273522	RES,CBN 1/2P 27K
725	R411	5135-223522	RES,CBN 1/2P 22K
725	R412	5135-223522	RES,CBN 1/2P 22K
726	R415	5135-334522	RES,CBN 1/2P 330K
726	R416	5135-334522	RES,CBN 1/2P 330K
720	R417	5135-103522	RES,CBN 1/2P 10K
720	R418	5135-103522	RES,CBN 1/2P 10K
727	R419	5135-331522	RES,CBN 1/2P 330
727	R420	5135-331522	RES,CBN 1/2P 330
723	R421	5135-222522	RES,CBN 1/2P 2.2K
719	R422	5135-472522	RES,CBN 1/2P 4.7K
719	R423	5135-472522	RES,CBN 1/2P 4.7K
728	R424	5135-102522	RES,CBN 1/2P 1K
730	R425	5135-100522	RES,CBN 1/2P 10
719	R427	5135-472522	RES,CBN 1/2P 4.7K
719	R428	5135-472522	RES,CBN 1/2P 4.7K
719	R429	5135-472522	RES,CBN 1/2P 4.7K
719	R430	5135-472522	RES,CBN 1/2P 4.7K
729	R431	5135-334522	RES,CBN 1/2P 330K
729	R432	5135-334522	RES,CBN 1/2P 330K
958	R601	5135-393522	RES,CBN 1/2P 39K
958	R602	5135-393522	RES,CBN 1/2P 39K
959	R603	5135-472522	RES,CBN 1/2P 4.7K
959	R604	5135-472522	RES,CBN 1/2P 4.7K
960	R605	5135-104522	RES,CBN 1/2P 100K
960	R606	5135-104522	RES,CBN 1/2P 100K
961	R607	5135-102522	RES,CBN 1/2P 1K
961	R608	5135-102522	RES,CBN 1/2P 1K
962	R609	5135-122522	RES,CBN 1/2P 1.2K
962	R610	5135-122522	RES,CBN 1/2P 1.2K
963	R611	5135-103522	RES,CBN 1/2P 10K
963	R612	5135-103522	RES,CBN 1/2P 10K
963	R613	5135-103522	RES,CBN 1/2P 10K
965	R614	5135-103522	RES,CBN 1/2P 10K
967	R615	5135-220522	RES,CBN 1/2P 22
969	R617	5135-473522	RES,CBN 1/2P 47K
969	R618	5135-473522	RES,CBN 1/2P 47K
967	R619	5135-220522	RES,CBN 1/2P 22
967	R620	5135-220522	RES,CBN 1/2P 22
967	R621	5135-220522	RES,CBN 1/2P 22
969	R622	5135-473522	RES,CBN 1/2P 47K
969	R625	5135-473522	RES,CBN 1/2P 47K
964	R626	5135-153522	RES,CBN 1/2P 15K
964	R627	5135-153522	RES,CBN 1/2P 15K
964	R628	5135-153522	RES,CBN 1/2P 15K
970	R629	5135-471522	RES,CBN 1/2P 470
970	R630	5135-471522	RES,CBN 1/2P 470
961	R631	5135-102522	RES,CBN 1/2P 1K

Ser.No.	Ref.No.	Part No.	Description
961	R632	5135-102522	RES,CBN 1/2P 1K
937	R651	5135-103522	RES,CBN 1/2P 10K
937	R652	5135-103522	RES,CBN 1/2P 10K
940	R657	5135-101522	RES,CBN 1/2P 100
940	R658	5135-101522	RES,CBN 1/2P 100
936	R659	5135-100522	RES,CBN 1/2P 10
936	R660	5135-100522	RES,CBN 1/2P 10
	R661	5232-472J16P	RES,CBN 1/6P 4.7K
	R661	5232-472J16P	RES,CBN 1/6P 4.7K
692	R701	5135-222522	RES,CBN 1/2P 2.2K
692	R702	5135-222522	RES,CBN 1/2P 2.2K
693	R703	5135-104522	RES,CBN 1/2P 100K
687	R705	5135-103522	RES,CBN 1/2P 10K
687	R706	5135-103522	RES,CBN 1/2P 10K
689	R707	5135-392522	RES,CBN 1/2P 3.9K
689	R708	5135-392522	RES,CBN 1/2P 3.9K
687	R709	5135-103522	RES,CBN 1/2P 10K
687	R710	5135-103522	RES,CBN 1/2P 10K
690	R711	5135-223522	RES,CBN 1/2P 22K
690	R712	5135-223522	RES,CBN 1/2P 22K
687	R713	5135-103522	RES,CBN 1/2P 10K
687	R714	5135-103522	RES,CBN 1/2P 10K
691	R717	5135-222522	RES,CBN 1/2P 2.2K
687	R718	5135-103522	RES,CBN 1/2P 10K
687	R719	5135-103522	RES,CBN 1/2P 10K
897	R751	5135-103522	RES,CBN 1/2P 10K
898	R752	5135-104522	RES,CBN 1/2P 100K
899	R753	5135-331522	RES,CBN 1/2P 330
898	R754	5135-104522	RES,CBN 1/2P 100K
899	R755	5135-331522	RES,CBN 1/2P 330
899	R756	5135-331522	RES,CBN 1/2P 330
902	R757	5135-332522	RES,CBN 1/2P 3.3K
898	R758	5135-104522	RES,CBN 1/2P 100K
903	R759	5135-471522	RES,CBN 1/2P 470
904	R761	5135-222522	RES,CBN 1/2P 2.2K
904	R762	5135-222522	RES,CBN 1/2P 2.2K
868	△ R801	5102-1005116	RES,FUSE 10
872	R804	5135-103522	RES,CBN 1/2P 10K
873	R806	5135-5R6522	RES,CBN 1/2P 5.6
873	R807	5135-5R6522	RES,CBN 1/2P 5.6
873	R808	5135-5R6522	RES,CBN 1/2P 5.6
873	R809	5135-5R6522	RES,CBN 1/2P 5.6
872	R811	5135-103522	RES,CBN 1/2P 10K
880	R812	5135-102522	RES,CBN 1/2P 1K
872	R813	5135-103522	RES,CBN 1/2P 10K
876	R815	5135-223522	RES,CBN 1/2P 22K
876	R816	5135-223522	RES,CBN 1/2P 22K
876	R817	5135-223522	RES,CBN 1/2P 22K
876	R818	5135-223522	RES,CBN 1/2P 22K
869	R819	5135-473522	RES,CBN 1/2P 47K
869	R820	5135-473522	RES,CBN 1/2P 47K
869	R821	5135-473522	RES,CBN 1/2P 47K
869	R822	5135-473522	RES,CBN 1/2P 47K
869	R823	5135-473522	RES,CBN 1/2P 47K
874	R825	5135-471522	RES,CBN 1/2P 470
874	R826	5135-471522	RES,CBN 1/2P 470
869	R827	5135-473522	RES,CBN 1/2P 47K
875	R828	5135-331522	RES,CBN 1/2P 330
880	R829	5135-102522	RES,CBN 1/2P 1K
876	R830	5135-32522	RES,CBN 1/2P 3.9K
870	R831	5135-470522	RES,CBN 1/2P 47
880	R833	5135-102522	RES,CBN 1/2P 1K

## INTEGRATED CIRCUITS

HYBRIDIZED CRYSTALS			
521	IC301	5653- $\mu$ 1297CA	IC, LINEAR
701	IC401	5652-NJM4A558D	IC, MONO
702	IC402	5653-BA6138	IC, LINEAR
941	IC601	5652-NJM4A558D	IC, MONO
942	IC602	5654-TC4066BP	IC, DIGITAL
942	IC603	5654-TC4066BP	IC, DIGITAL
931	IC651	5653-NJM4A565D	IC, LINEAR
671	IC701	5654-TC4011BP	IC, DIGITAL
881	IC751	5652-NJM4A558D	IC, MONO
851	IC801	5653-BA6229	IC, LINEAR

## TRANSISTORS

402	Q101	5613-2320L(F)	XISTOR,NPN R
402	Q102	5613-2320L(F)	XISTOR,NPN R

Ser.No.	Ref.No.	Part No.	Description
401	Q103	5611-999L(F)	XISTOR,PNP R
401	Q104	5611-999L(F)	XISTOR,PNP R
402	Q105	5613-2320L(F)	XISTOR,NPN R
402	Q106	5613-2320L(F)	XISTOR,NPN R
401	Q107	5611-999L(F)	XISTOR,PNP R
401	Q108	5611-999L(F)	XISTOR,PNP R
402	Q109	5613-2320L(F)	XISTOR,NPN R
402	Q110	5613-2320L(F)	XISTOR,NPN R
401	Q111	5611-999L(F)	XISTOR,PNP R
401	Q112	5611-999L(F)	XISTOR,PNP R
403	Q113	5616-2SK246GR	FET,N-CH
403	Q114	5616-2SK246GR	FET,N-CH
404	Q115	5613-UN4214	XISTOR,NPN R
463	Q201	5613-UN4214	XISTOR,NPN R
463	Q202	5613-UN4214	XISTOR,NPN R
463	Q203	5613-UN4214	XISTOR,NPN R
463	Q204	5613-UN4214	XISTOR,NPN R
463	Q205	5613-UN4214	XISTOR,NPN R
463	Q206	5613-UN4214	XISTOR,NPN R
464	Q207	5614-1450(T)	XISTOR,NPN A
464	Q208	5614-1450(T)	XISTOR,NPN A
461	Q209	5613-2320L(F)	XISTOR,NPN R
461	Q210	5613-2320L(F)	XISTOR,NPN R
462	Q211	5611-999L(F)	XISTOR,PNP R
462	Q212	5611-999L(F)	XISTOR,PNP R
462	Q213	5611-999L(F)	XISTOR,PNP R
462	Q214	5611-999L(F)	XISTOR,PNP R
461	Q215	5613-2320L(F)	XISTOR,NPN R
461	Q216	5613-2320L(F)	XISTOR,NPN R
461	Q217	5613-2320L(F)	XISTOR,NPN R
461	Q218	5613-2320L(F)	XISTOR,NPN R
465	Q219	5611-UN4114	XISTOR,PNP R
525	Q301	5613-2320(F)	XISTOR,NPN R
525	Q302	5613-2320(F)	XISTOR,NPN R
527	Q303	5611-1309A(R)	XISTOR,PNP R
523	Q304	5613-UN4214	XISTOR,NPN R
526	Q305	5611-950(Y)	XISTOR,PNP R
522	Q306	5613-2120(Y)	XISTOR,NPN R
526	Q307	5611-950(Y)	XISTOR,PNP R
522	Q308	5613-2120(Y)	XISTOR,NPN R
524	Q309	5613-UN4214	XISTOR,NPN R
524	Q310	5613-UN4214	XISTOR,NPN R
524	Q311	5613-UN4214	XISTOR,NPN R
524	Q312	5613-UN4214	XISTOR,NPN R
523	Q313	5613-UN4214	XISTOR,NPN R
528	Q314	5611-UN4114	XISTOR,PNP R
911	Q351	5613-2320L(F)	XISTOR,NPN R
911	Q352	5613-2320L(F)	XISTOR,NPN R
912	Q353	5611-999L(F)	XISTOR,PNP R
912	Q354	5611-999L(F)	XISTOR,PNP R
912	Q355	5611-999L(F)	XISTOR,PNP R
912	Q356	5611-999L(F)	XISTOR,PNP R
913	Q357	5616-2SK246BL	FET,N-CH
913	Q358	5616-2SK246BL	FET,N-CH
705	Q401	5613-331A(R)	XISTOR,NPN R
705	Q402	5613-331A(R)	XISTOR,NPN R
705	Q403	5613-331A(R)	XISTOR,NPN R
705	Q404	5613-331A(R)	XISTOR,NPN R
704	Q405	5611-999(F)	XISTOR,PNP R
944	Q601	5613-UN4214	XISTOR,NPN R
944	Q602	5613-UN4214	XISTOR,NPN R
944	Q603	5613-UN4214	XISTOR,NPN R
944	Q604	5613-UN4214	XISTOR,NPN R
944	Q605	5613-UN4214	XISTOR,NPN R
945	Q606	5611-UN4114	XISTOR,PNP R
945	Q607	5611-UN4114	XISTOR,PNP R
673	Q701	5613-2878(B)	XISTOR,NPN R
673	Q702	5613-2878(B)	XISTOR,NPN R
672	Q703	5613-2240(BL)	XISTOR,NPN R
672	Q704	5613-2240(BL)	XISTOR,NPN R
672	Q705	5613-2240(BL)	XISTOR,NPN R
672	Q706	5613-2240(BL)	XISTOR,NPN R
677	Q707	5614-1450(T)	XISTOR,NPN A
677	Q708	5614-1450(T)	XISTOR,NPN A
677	Q709	5614-1450(T)	XISTOR,NPN A
677	Q710	5614-1450(T)	XISTOR,NPN A
675	Q713	5611-970(BL)	XISTOR,PNP R
676	Q714	5611-UN4114	XISTOR,PNP R

Ser.No.	Ref.No.	Part No.	Description
674	Q715	5613-UN4214	XISTOR,NPN R
676	Q716	5611-UN4114	XISTOR,PNP R
676	Q717	5611-UN4114	XISTOR,PNP R
676	Q718	5611-UN4114	XISTOR,PNP R
676	Q719	5611-UN4114	XISTOR,PNP R
676	Q720	5611-UN4114	XISTOR,PNP R
676	Q721	5611-UN4114	XISTOR,PNP R
673	Q723	5613-2878(B)	XISTOR,NPN R
673	Q724	5613-2878(B)	XISTOR,NPN R
857	Q801	5613-UN4214	XISTOR,NPN R
855	Q802	5613-2925(T)	XISTOR,NPN R
855	Q803	5613-2925(T)	XISTOR,NPN R
855	Q804	5613-2925(T)	XISTOR,NPN R
852	Q805	5613-3311A(R)	XISTOR,NPN R
852	Q806	5613-3311A(R)	XISTOR,NPN R
853	Q808	5611-UN4114	XISTOR,PNP R
<b>DIODES</b>			
467	D201	5631-1S2473	DIODE,DET
467	D202	5631-1S2473	DIODE,DET
467	D203	5631-1S2473	DIODE,DET
467	D204	5631-1S2473	DIODE,DET
467	D205	5631-1S2473	DIODE,DET
529	D301	5631-1S2473	DIODE,DET
529	D302	5631-1S2473	DIODE,DET
529	D303	5631-1S2473	DIODE,DET
707	D401	5631-1S2473	DIODE,DET
707	D402	5631-1S2473	DIODE,DET
946	D601	5635-RD5R1EB2	DIODE,ZENER
946	D602	5635-RD5R1EB2	DIODE,ZENER
946	D603	5635-RD5R1EB2	DIODE,ZENER
946	D604	5635-RD5R1EB2	DIODE,ZENER
947	D605	5631-1S2473	DIODE,DET
947	D606	5631-1S2473	DIODE,DET
947	D607	5631-1S2473	DIODE,DET
679	D701	5631-1S2473	DIODE,DET
883	D751	5631-1S2473	DIODE,DET
860	D801	5635-HZ7C3	DIODE,ZENER
859	D802	5635-HZ5C2	DIODE,ZENER
863	D803	5631-1S2473	DIODE,DET
862	D804	5632-S5566B	DIODE,RECT
863	D806	5631-1S2473	DIODE,DET
<b>COILS</b>			
409	L101	5995-S200J273	COIL W/CORE
409	L102	5995-S200J273	COIL W/CORE
469	L201	5932-11504	COIL CASE,7
469	L202	5932-11504	COIL CASE,7
532	L301	5932-11401	COIL CASE,7
532	L302	5932-11401	COIL CASE,7
<b>CONTROLS</b>			
411	VR101	5101-50301934	RES,SEMI FIX 50K
411	VR102	5101-50301934	RES,SEMI FIX 50K
738	CVR151	5113-S1101503	RES,V CBN 16
152			
473	VR203	5101-20201934	RES,SEMI FIX 2K
473	VR204	5101-20201934	RES,SEMI FIX 2K
535	VR301	5101-20301934	RES,SEMI FIX 20K
535	VR302	5101-20301934	RES,SEMI FIX 20K
537	VR303	5101-20201934	RES,SEMI FIX 2K
537	VR304	5101-20201934	RES,SEMI FIX 2K
536	VR305	5101-50201934	RES,SEMI FIX 5K
536	VR306	5101-50201934	RES,SEMI FIX 5K
709	VR401	5101-20301934	RES,SEMI FIX 20K
709	VR402	5101-20301934	RES,SEMI FIX 20K
949	VR601	5101-50201934	RES,SEMI FIX 5K
949	VR602	5101-50201934	RES,SEMI FIX 5K
949	VR603	5101-50201934	RES,SEMI FIX 5K
885	VR751	5101-10401934	RES,SEMI FIX 100K
<b>MISCELLANEOUS</b>			
782	▲ J1	4484-46	PIN JACK,4P
781	J2	4451-00184	JACK,1P
781	J3	4451-00184	JACK,1P
792	JL101	4242-R0503800	JUMPER LEAD
793	JL102	4242-R0504800	JUMPER LEAD
794	JL103	4242-R0505800	JUMPER LEAD

Ser.No.	Ref.No.	Part No.	Description
795	JL104	4242-R0505800	JUMPER LEAD
808	CN105	4443-0601102	CONNECTOR
809	CN301	4443-0201102	CONNECTOR
818	CN551	4443-04501010	CONNECTOR
819	CN552	4443-04501007	CONNECTOR
814	CN801	4443-00501010	CONNECTOR
814	CN802	4443-00501010	CONNECTOR
812	CN803	4443-05501032	CONNECTOR
797	LCN801	4163-01301005	CONNECTOR W/W
798	LCN802	4163-01325007	CONNECTOR W/W
799	LCN803	4163-01322005	CONNECTOR W/W
471	LC201	5214-13802LC	COMPOSITE
471	LC202	5214-13802LC	COMPOSITE
470	LC203	5214-13901LC	COMPOSITE
470	LC204	5214-13901LC	COMPOSITE
858	PH801	5624-ON3161	PHOTO COUPLR
533	T301	5923-10303	OSC COIL,10
776	TP101	4214-132	TERMINAL
776	TP102	4214-132	TERMINAL
776	TP103	4214-132	TERMINAL
776	TP201	4214-132	TERMINAL
776	TP202	4214-132	TERMINAL
776	TP203	4214-132	TERMINAL
776	TP501	4214-132	TERMINAL
776	TP502	4214-132	TERMINAL
776	TP751	4214-132	TERMINAL

## PCB-2 FRONT P. C. BOARD

## CAPACITORS

833	C901	5345-106E041	CAP,MINI ELE 10 $\mu$ /35V
834	C902	5359-S010J103	CAP,PPPP .01 $\mu$
832	C903	5345-476C041	CAP,MINI ELE 47 $\mu$ /16V
830	C904	5342-106C041	CAP,ELE BP 10 $\mu$ /16V
831	C905	5345-106C041	CAP,MINI ELE 10 $\mu$ /16V
835	C906	5361-102KB	CAP,CER 1000P
835	C907	5361-102KB	CAP,CER 1000P

## RESISTORS

841	R901	5135-104522	RES,CBN 1/2P 100K
837	R902	5135-102522	RES,CBN 1/2P 1K
838	R903	5135-183522	RES,CBN 1/2P 18K
839	R904	5135-273522	RES,CBN 1/2P 27K
838	R905	5135-183522	RES,CBN 1/2P 18K
839	R906	5135-273522	RES,CBN 1/2P 27K
842	R907	5135-101522	RES,CBN 1/2P 100
838	R909	5135-183522	RES,CBN 1/2P 18K
839	R910	5135-273522	RES,CBN 1/2P 27K
838	R911	5135-183522	RES,CBN 1/2P 18K
839	R912	5135-273522	RES,CBN 1/2P 27K
836	R914	5135-473522	RES,CBN 1/2P 47K
836	R915	5135-473522	RES,CBN 1/2P 47K
840	R916	5135-822522	RES,CBN 1/2P 8.2K
840	R917	5135-822522	RES,CBN 1/2P 8.2K
836	R918	5135-473522	RES,CBN 1/2P 47K
843	R919	5135-102522	RES,CBN 1/2P 1K
843	R920	5135-102522	RES,CBN 1/2P 1K
843	R921	5135-102522	RES,CBN 1/2P 1K
843	R922	5135-102522	RES,CBN 1/2P 1K
843	R923	5135-102522	RES,CBN 1/2P 1K

## INTEGRATED CIRCUIT

821	IC901	5654-MN18787F	IC,DIGITAL
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## TRANSISTORS

823	Q901	5611-UN4114	XISTOR,PNP R
823	Q902	5611-UN4114	XISTOR,PNP R
823	Q903	5611-UN4114	XISTOR,PNP R
823	Q904	5611-UN4114	XISTOR,PNP R
823	Q905	5611-UN4114	XISTOR,PNP R
824	Q906	5613-3311A(R)	XISTOR,NPN R

## DIODES

829	D903	5631-1S2473	DIODE,DET
829	D904	5631-1S2473	DIODE,DET
829	D905	5631-1S2473	DIODE,DET

Ser.No.	Ref.No.	Part No.	Description
<b>CONTROLS</b>			
742	VR901/902	5109-S0305502	RES,V CBN 5K
746	VR903	5109-S0402502	RES,V CBN 5K
746	VR904	5109-S0402502	RES,V CBN 5K
746	VR905	5109-S0402502	RES,V CBN 5K
825	RCV901	6143-00802	RECEIV BLOCK

<b>MISCELLANEOUS</b>			
813	CN901	4443-00401010	CONNECTOR
813	CN902	4443-00401010	CONNECTOR
810	CN903	4443-05401032	CONNECTOR
827	X901	5693-FC4004A4	OSC,CER
758	FL901	5722-050	TUBE DISPLAY
845	RC901	5212-S0305273	R COMPOSITE
846	RC902	5212-S0304104	R COMPOSITE
735	SW901	4437-00604	PUSH SWITCH
735	SW902	4437-00604	PUSH SWITCH
735	SW903	4437-00604	PUSH SWITCH
735	SW904	4437-00604	PUSH SWITCH
735	SW905	4437-00604	PUSH SWITCH
735	SW906	4437-00604	PUSH SWITCH
733	SW907	4431-S0114204	PUSH SWITCH
734	SW908	4431-S0116612	PUSH SWITCH
734	SW909	4431-S0116612	PUSH SWITCH
734	SW910	4431-S0116612	PUSH SWITCH
735	SW911	4437-00604	PUSH SWITCH
735	SW912	4437-00604	PUSH SWITCH
735	SW913	4437-00604	PUSH SWITCH
735	SW915	4437-00604	PUSH SWITCH
735	SW916	4437-00604	PUSH SWITCH
735	SW917	4437-00604	PUSH SWITCH
734	SW918	4431-S0116612	PUSH SWITCH
734	SW919	4431-S0116612	PUSH SWITCH
734	SW920	4431-S0116612	PUSH SWITCH
733	SW921	4431-S0114204	PUSH SWITCH

**PCB-3 DOLBY B/C NR P. C. BOARD**

<b>CAPACITORS</b>			
649	C501	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
649	C502	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
649	C503	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
649	C504	5345-105F0951	CAP,MINI ELE 1 $\mu$ /50V
657	C507	5359-S010J222	CAP,PPP 2200P
657	C508	5359-S010J222	CAP,PPP 2200P
657	C509	5359-S010J222	CAP,PPP 2200P
657	C510	5359-S010J222	CAP,PPP 2200P
655	C511	5354-564593	CAP,MYL .56 $\mu$
655	C512	5354-564593	CAP,MYL .56 $\mu$
656	C513	5354-334593	CAP,MYL .33 $\mu$
656	C514	5354-334593	CAP,MYL .33 $\mu$
651	C515	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
651	C516	5345-106C0951	CAP,MINI ELE 10 $\mu$ /16V
652	C517	5345-227B041	CAP,MINI ELE 220 $\mu$ /10V
652	C518	5345-227B041	CAP,MINI ELE 220 $\mu$ /10V
657	C519	5359-S010J222	CAP,PPP 2200P
657	C520	5359-S010J222	CAP,PPP 2200P
658	C521	5359-S010J182	CAP,PPP 1800P
658	C522	5359-S010J182	CAP,PPP 1800P
653	C523	5345-107C041	CAP,MINI ELE 100 $\mu$ /16V
653	C524	5345-107C041	CAP,MINI ELE 100 $\mu$ /16V

<b>RESISTORS</b>			
666	R503	5135-332522	RES,CBN 1/2P 3.3K
666	R504	5135-332522	RES,CBN 1/2P 3.3K
659	R505	5135-822522	RES,CBN 1/2P 8.2K
659	R506	5135-822522	RES,CBN 1/2P 8.2K
662	R507	5174-243381	RES,MTL 1/4 24K
662	R508	5174-243381	RES,MTL 1/4 24K
663	R509	5174-561381	RES,MTL 1/4 560
663	R510	5174-561381	RES,MTL 1/4 560
664	R511	5174-273381	RES,MTL 1/4 27K
670	R512	5135-102522	RES,CBN 1/2P 1K
669	R513	5135-105522	RES,CBN 1/2P 1M
669	R514	5135-105522	RES,CBN 1/2P 1M
669	R515	5135-105522	RES,CBN 1/2P 1M

Ser.No.	Ref.No.	Part No.	Description
669	R516	5135-105522	RES,CBN 1/2P 1M
668	R517	5135-223522	RES,CBN 1/2P 22K
665	R518	5135-123522	RES,CBN 1/2P 12K
661	R519	5135-682522	RES,CBN 1/2P 6.8K
661	R520	5135-682522	RES,CBN 1/2P 6.8K
660	R521	5135-562522	RES,CBN 1/2P 5.6K
660	R522	5135-562522	RES,CBN 1/2P 5.6K

**INTEGRATED CIRCUIT**

641	IC501	5653-CXA1332S	IC,LINEAR
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**TRANSISTORS**

643	Q501	5613-UN4214	XISTOR,NPN R
643	Q502	5613-UN4214	XISTOR,NPN R
643	Q503	5613-UN4214	XISTOR,NPN R
643	Q504	5613-UN4214	XISTOR,NPN R
643	Q505	5613-UN4214	XISTOR,NPN R
642	Q506	5611-UN4114	XISTOR,PNP R
644	Q507	5611-950(Y)	XISTOR,PNP R
645	Q508	5613-2120(Y)	XISTOR,NPN R

**MISCELLANEOUS**

816	CN501	4443-04401010	CONNECTOR
817	CN502	4443-04401007	CONNECTOR
647	LC501	5214-13701	LC COMPOSITE
647	LC502	5214-13701	LC COMPOSITE

**PCB-4 POWER P. C. BOARD****CAPACITORS**

615	△C1	5352-S010M103	CAP,MTL .01 $\mu$	UA BK
615A	△C1	5352-1030961	CAP,MTL .01 $\mu$	I IB BB
616	C2	5352-S060K104	CAP,MTL .1 $\mu$	
616	C3	5352-S060K104	CAP,MTL .1 $\mu$	
616	C4	5352-S060K104	CAP,MTL .1 $\mu$	
603	C5	5345-228D041	CAP,MINI ELE 2200 $\mu$ /25V	
603	C6	5345-228D041	CAP,MINI ELE 2200 $\mu$ /25V	
604	C7	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V	
604	C8	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V	
605	C9	5345-108C041	CAP,MINI ELE 1000 $\mu$ /16V	
605	C10	5345-108C041	CAP,MINI ELE 1000 $\mu$ /16V	
607	C11	5345-478D0962	CAP,MINI ELE 4700 $\mu$ /25V	
604	C12	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V	
605	C13	5345-108C041	CAP,MINI ELE 1000 $\mu$ /16V	
604	C14	5345-227C041	CAP,MINI ELE 220 $\mu$ /16V	
605	C15	5345-108C041	CAP,MINI ELE 1000 $\mu$ /16V	
606	C16	5345-226F041	CAP,MINI ELE 22 $\mu$ /50V	
609	C17	5345-477E041	CAP,MINI ELE 470 $\mu$ /35V	
684	C51	5345-226D041	CAP,MINI ELE 22 $\mu$ /25V	
685	C52	5345-106F041	CAP,MINI ELE 10 $\mu$ /50V	
685	C53	5345-106F041	CAP,MINI ELE 10 $\mu$ /50V	
686	C54	5345-107D041	CAP,MINI ELE 100 $\mu$ /25V	
865	C851	5345-107B041	CAP,MINI ELE 100 $\mu$ /10V	

**RESISTORS**

042A	R1	5135-335522	RES,CBN 1/2P 3.3M	I IB BB
619	R3	5135-152522	RES,CBN 1/2P 1.5K	
619	R4	5135-152522	RES,CBN 1/2P 1.5K	
620	R5	5135-471522	RES,CBN 1/2P 470	
620	R6	5135-471522	RES,CBN 1/2P 470	
621	R7	5135-101522	RES,CBN 1/2P 100	
621	R8	5135-101522	RES,CBN 1/2P 100	
622	R9	5135-2R7522	RES,CBN 1/2P 2.7	
622	R10	5135-2R7522	RES,CBN 1/2P 2.7	
619	R11	5135-152522	RES,CBN 1/2P 1.5K	
620	R12	5135-471522	RES,CBN 1/2P 470	
621	R13	5135-101522	RES,CBN 1/2P 100	
623	R14	5135-0R5522	RES,CBN 1/2P .5	UA BK
619	R15	5135-152522	RES,CBN 1/2P 1.5K	
620	R16	5135-471522	RES,CBN 1/2P 470	
629	△R17	5102-1014715	RES,FUSE 100	
624	R18	5135-5R6522	RES,CBN 1/2P 5.6	
626	R19	5135-221522	RES,CBN 1/2P 220	
625	R20	5135-223522	RES,CBN 1/2P 22K	
625	R21	5135-223522	RES,CBN 1/2P 22K	
043A	△R22	5102-1R05116	RES,FUSE 1	I IB BB
699	R51	5135-331522	RES,CBN 1/2P 330	



Ser.No.	Ref.No.	Part No.	Description
697	R52	5135-562522	RES,CBN 1/2P 5.6K
696	R53	5135-154522	RES,CBN 1/2P 150K
700	R54	5135-102522	RES,CBN 1/2P 1K
700	R55	5135-102522	RES,CBN 1/2P 1K
695	R56	5135-104522	RES,CBN 1/2P 100K
694	R57	5135-103522	RES,CBN 1/2P 10K
698	R58	5135-182522	RES,CBN 1/2P 1.8K
699	R59	5135-331522	RES,CBN 1/2P 330
877	R851	5135-102522	RES,CBN 1/2P 1K
878	R852	5135-471522	RES,CBN 1/2P 470
879	R853	5135-103522	RES,CBN 1/2P 10K
877	R854	5135-102522	RES,CBN 1/2P 1K

**TRANSISTORS**

581	Q1	5612-941(P)	XISTOR,PNP A
582	Q2	5614-1266(P)	XISTOR,NPN A
586	Q3	5613-2320(F)	XISTOR,NPN R
585	Q4	5611-999(F)	XISTOR,PNP R
586	Q5	5613-2320(F)	XISTOR,NPN R
585	Q6	5611-999(F)	XISTOR,PNP R
581	Q7	5612-941(P)	XISTOR,PNP A
586	Q8	5613-2320(F)	XISTOR,NPN R
587	Q9	5613-2320(F)	XISTOR,NPN R
581	Q10	5612-941(P)	XISTOR,PNP A
586	Q11	5613-2320(F)	XISTOR,NPN R
586	Q12	5613-2320(F)	XISTOR,NPN R
678	Q51	5611-999(F)	XISTOR,PNP R
854	Q851	5613-3311A(R)	XISTOR,NPN R
856	Q852	5611-UN4114	XISTOR,PNP R

**DIODES**

589	D1	5632-S5566B	DIODE,RECT
589	D2	5632-S5566B	DIODE,RECT
589	D3	5632-S5566B	DIODE,RECT
589	D4	5632-S5566B	DIODE,RECT
589	D5	5632-S5566B	DIODE,RECT
589	D6	5632-S5566B	DIODE,RECT
590	D7	5632-S5566B	DIODE,RECT
590	D8	5632-S5566B	DIODE,RECT
591	D9	5635-HZ12B2L	DIODE,ZENER
591	D10	5635-HZ12B2L	DIODE,ZENER
591	D11	5635-HZ12B2L	DIODE,ZENER
592	D12	5635-HZ6B2L	DIODE,ZENER
593	D13	5635-HZ18-2L	DIODE,ZENER
594	D14	5635-RD5R1EB3	DIODE,ZENER
864	D51	5632-S5566B	DIODE,RECT
864	D52	5632-S5566B	DIODE,RECT
680	D53	5631-1S2473	DIODE,DET
682	D54	5635-RD5R1EB2	DIODE,ZENER
681	D55	5635-RD12EB2	DIODE,ZENER
864	D56	5632-S5566B	DIODE,RECT
864	D57	5632-S5566B	DIODE,RECT
861	D851	5635-HZ3B2	DIODE,ZENER

**TRANSFORMERS**

601	△T1	5584-S8501	XFORMER,POWER
601A	△T1	5584-S8502	XFORMER,POWER

**MISCELLANEOUS**

755	△F1	5732-501031	FUSE
755A	△F1	5732-251030	FUSE
731	△S1	4433-00202	PUSH SWITCH,POWER
041A	△S2	4411-1047111	ROTARY SWITCH
805	CN101	4443-030185	CONNECTOR
806	CN102	4443-040185	CONNECTOR
807	CN103	4443-050185	CONNECTOR
807	CN104	4443-050185	CONNECTOR
754	△HL1	4472-04501	FUSE HOLDER
754	△HL2	4472-04501	FUSE HOLDER
777	TM1	4214-122	TERMINAL
777	TM2	4214-122	TERMINAL

Ser.No.	Ref.No.	Part No.	Description
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**ABBREVIATIONS IN PARTS LIST****CAPACITORS**

CAP,MINI ELE	:Electrolytic
CAP,CER	:Ceramic
CAP,PPP	:Polypropylene
CAP,MYL	:Mylar
CAP,MTL	:Metal
CAP,MCA	:Mica
CAP,MINI BP	:Bipolar
CAP,ELE BP	:Electrolytic Bipolar
CAP,STY	:Polystyrene Film
CAP,SPE	:Special
CAP,TAN	:Tantalum
470μ	:470μF
6800p	:6800pF
.047μ	:0.047μF

**RESISTORS**

RES,CBN 1/6P	:Carbon 1/6W
RES,FUSE	:Fuse
RES,CEM 5P	:Cement 5W
RES,MTL 1P	:Metal 1W
2.2K	:2.2KΩ
220	:220Ω

**TRANSISTORS**

XISTOR	:Transistor
FET	:Field Effect Transistor

**CONTROLS**

RES,V CBN	:Variable Carbon Resistor
RES,SEMI FIX	:Semi-fixed Resistor

**CHASSIS MISCELLANEOUS**

761	△P1	4161-71151	CORD W/PLUG	UA	BK
761A	△P1	4161-7256	CORD W/PLUG	I	IB
761D	△P1	4161-04100	CORD W/PLUG	BB	
791		4242-S0232131	JUMPER LEAD		

**PACKAGE PARTS LIST**

021A	1756-06303	LABEL	I	IB	BB
022A	1756-03124	LABEL	I	IB	
022D	1756-03111	LABEL	BB		
023D	1756-08501	LABEL	BB		
024D	1111-J30319	OWNER GUIDE	BB		
106	1111-J30325	OWNER GUIDE	UA	BK	
106A	1111-J30326	OWNER GUIDE	I	IB	
107	1113-717004	OWNER CARD	UA	BK	
111	1119-047	ATTACH SHEET,GUARANTY	UA	BK	
112	1119-0137	ATTACH SHEET,SERVICE			
		STATION GUIDE	UA	BK	
113	1119-01201	ATTACH SHEET,SAFETY	UA	BK	
115	1221-28008	CARTON BOX	UA	I	
115A	1221-28005	CARTON BOX	BK	IB	BB
116	1222-7362	CUSHION			
117	1222-7365	CUSHION			
119	1223-R0220055	SOFT SHEET,SET FRONT			
123	1241-R0160600	POLYETHY BAG,SET			
124	1241-R0123350	POLYETHY BAG,OWNER GUIDE			
762	4161-71184	CORD W/PLUG,RCA TYPE			
773	4191-0355	BATTERY,DRY			
774	6142-02703	REMOTE CONTROL ASSEMBLY			

**NOTE**

⚠ SAFETY RELATED COMPONENT.USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

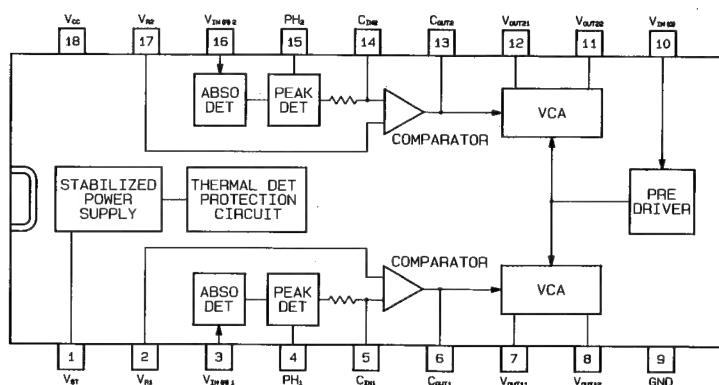
**PCB-5 HEAD PHONE P. C. BOARD****MISCELLANEOUS**

751	J651	4451-51501	JACK,1P
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## IC BLOCK DIAGRAM

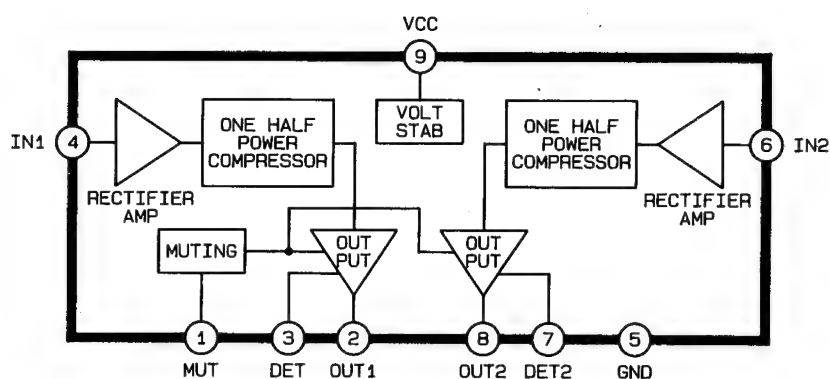
IC301 :  $\mu$ PC1297CA

Dolby HX Pro



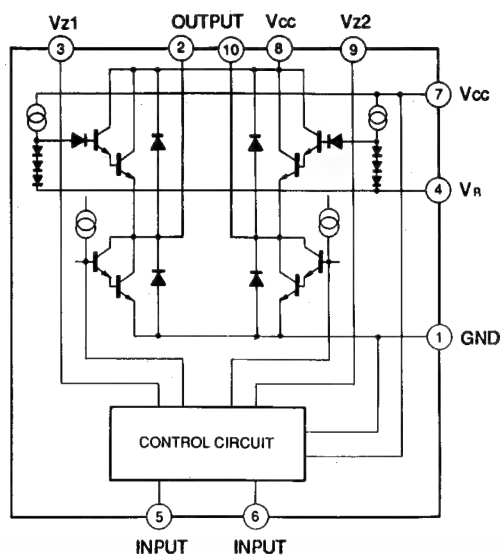
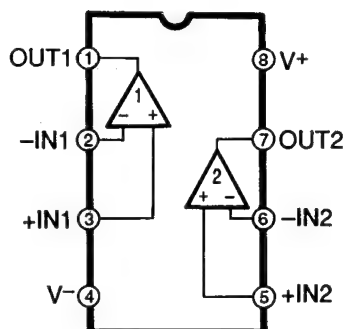
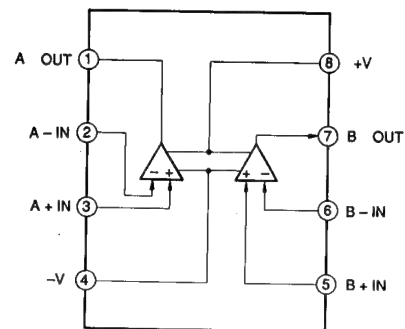
IC402 : BA6138

Signal Level Meter

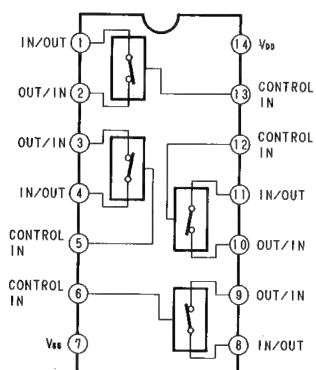


IC801 : BA6229

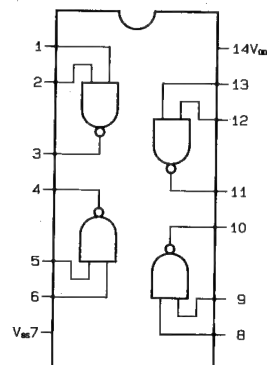
Motor Driver

IC651 : NJM4565D  
OP-Amp.IC401,601,751 : NJM4558D  
OP-Amp.

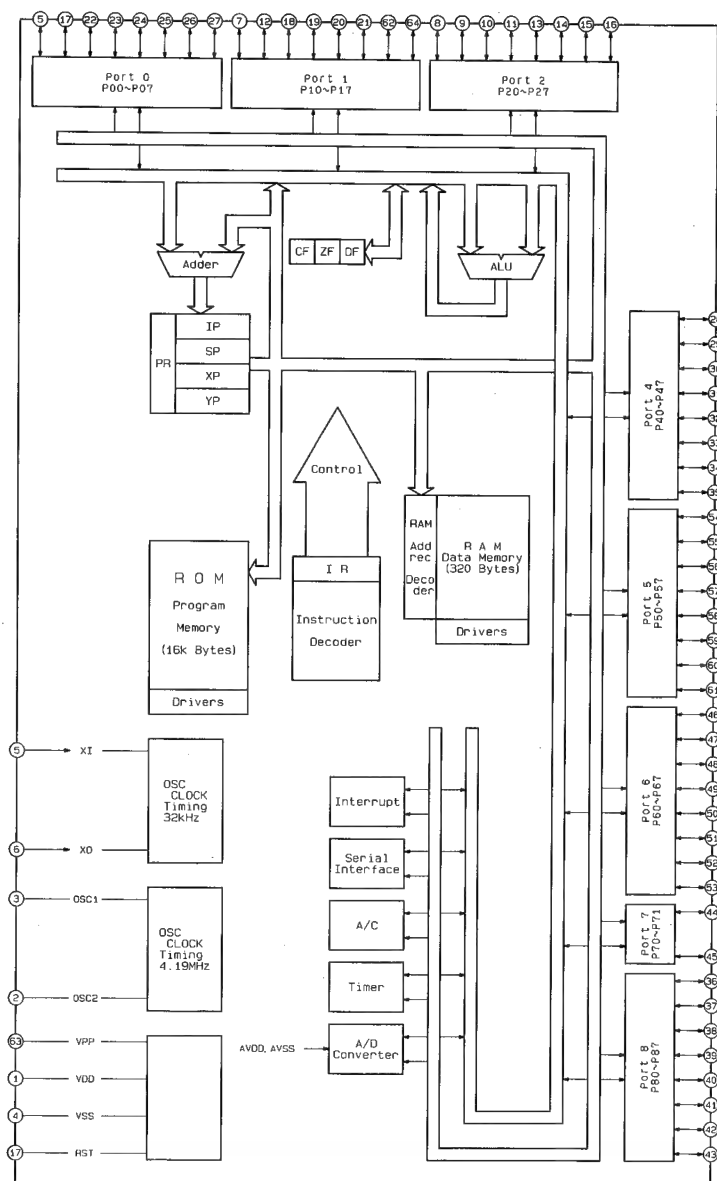
IC602,603 :TC4066BP  
Bilateral Switch



IC701 :TC4011BP  
2-inch NAND Gate



IC901 :MN18787F  
Logic Controller



## TERMINAL FUNCTIONS

Pin No.	Port name	Function name	I/O	Outline of functions
5	P06	XI	I	Initial setting switch. High level=ON
6	XO	XO	O	
7	P17	AVdd	I	D/A converter standard voltage(DC 5V).
8	P27	AD7	I	Key input terminal.
9	P26	AD6	I	Key input terminal.
10	P25	AD5	I	Key input terminal.
11	P24	AD4	I	Key input terminal.
12	P16	AVss	I	GND terminal.
13	P23	AD3	I	Key input terminal.
14	P22	AD2	I	A/D input port for LEVEL METER indication.
15	P21	AD1	I	A/D input port for LEVEL METER indication.
16	P20	AD0	I	A/D input port for music search.
17	P07	RST	I	Reset input.
18	1RQ1	R-SI	I	Remote control input.
19	1RQI	VOLT DN	I	Power on/off detection terminal. Low level=OFF
20	P13	DOLBY-B	I	Input port to switch DOLBY display.
21	P12	DOLBY-C	I	Input port to switch DOLBY display.
22	P05	IND.CONT	O	High level on stand-by or display off and after power off.
23	P04	MONITOR	O	High level on MONITOR mode. Low level on SOURCE mode.
24	P03	REC	O	REC/PLAY switching terminal. High level on REC.
25	P02	BIAS	O	BIAS control terminal. High level=BIAS ON
26	P01	REC MUTE	O	Recording amp. muting terminal. High level=MUTING ON
27	P00	PB MUTE	O	Playback amp. muting terminal. High level=MUTING ON
28	P47	LINE MUTE	O	Line muting terminal. High level=MUTING ON
29	P46	RM1	O	Reel motor control. High level=active
30	P45	RM2	O	Reel motor control. High level=active
31	P44	RPC	O	Reel motor power control. High level=power down
32	P43	CPM	O	Capstan motor control.

NOTE: Low level=0V  
High level=5.1V



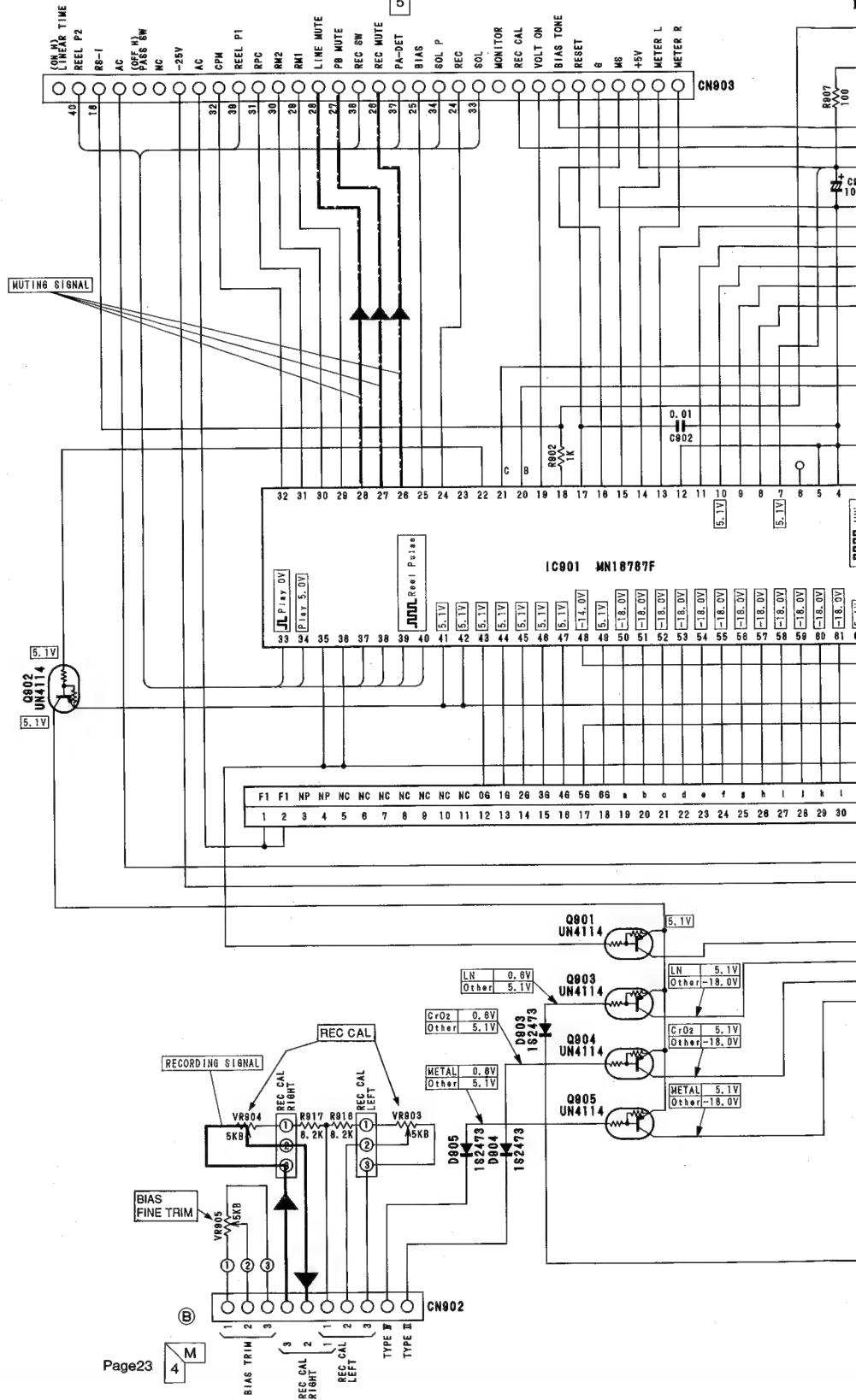


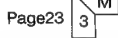
# SCHEMATIC DIAGRAM (1)

PCB-2 Front P. C. Board

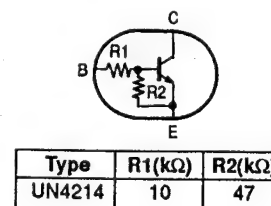
(A) Page23

M1






**PCB-3** **Dolby B/C NR P. C. Board**

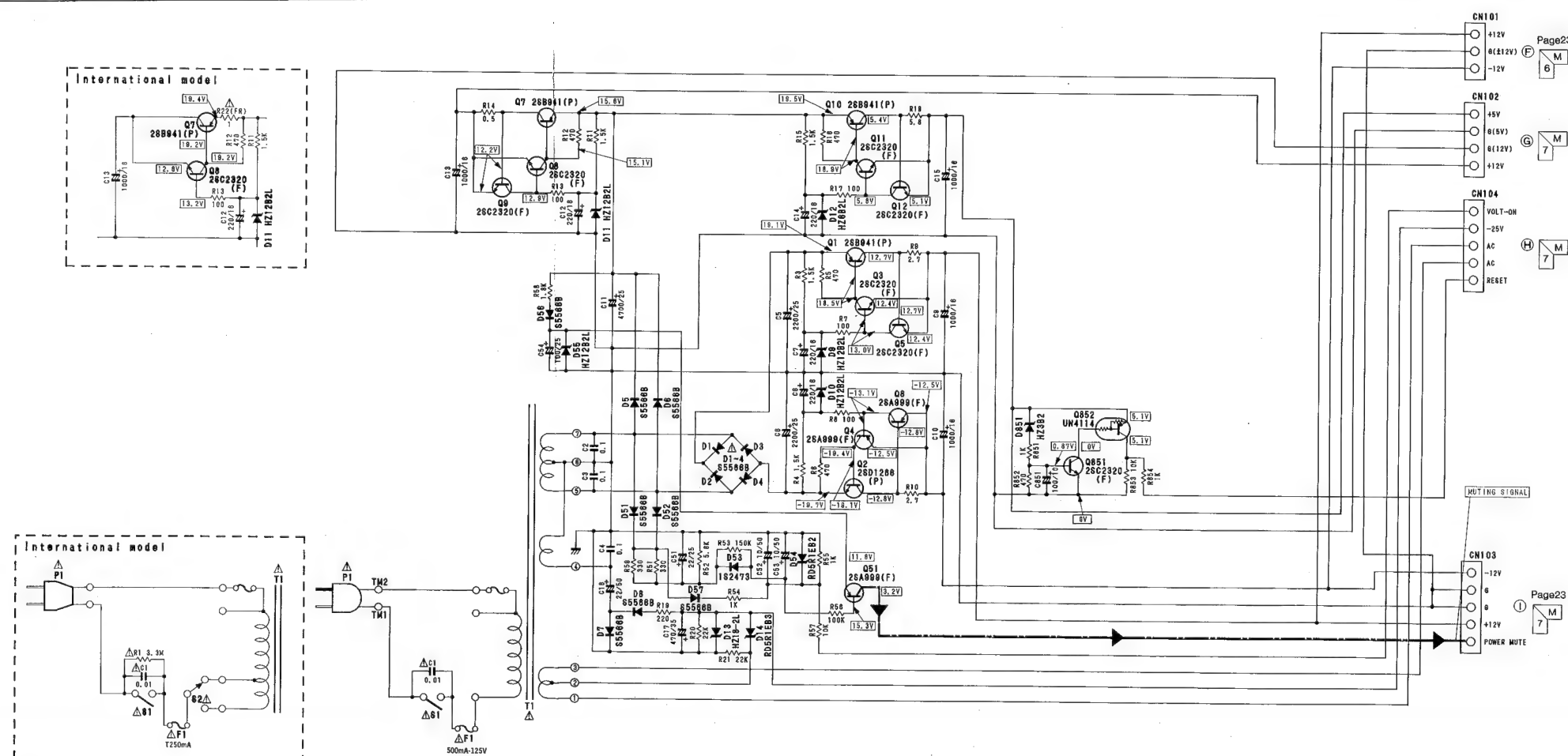


Type	R1(k $\Omega$ )	R2(k $\Omega$ )
UN4114	10	47
RN2201	4.7	4.7

**NOTE:**

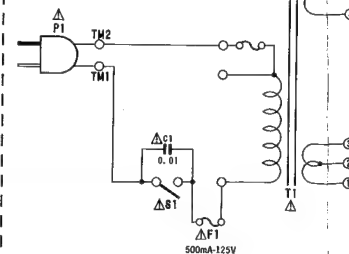
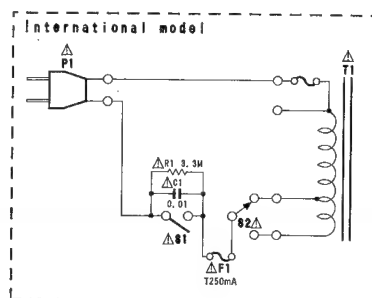
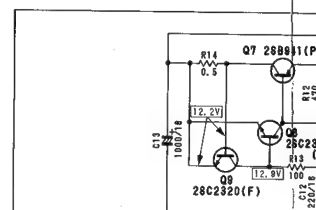
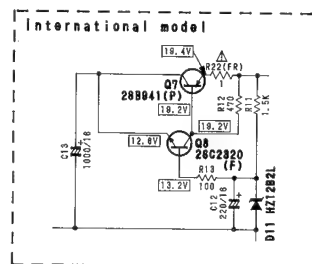
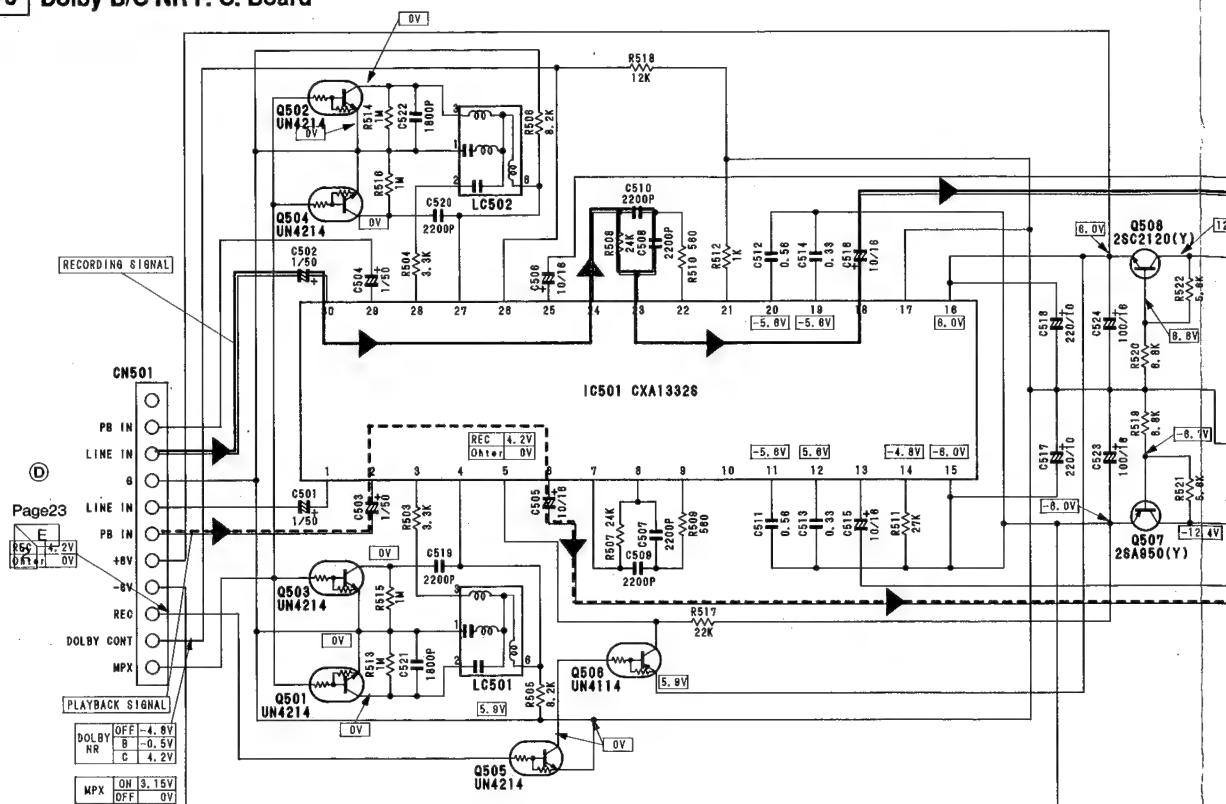
1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
 $K\Omega=1000\Omega$ ,  $M\Omega=1000K\Omega$ .
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUE ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  $P=\mu\mu F$ .
4. ...V : DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5.  SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

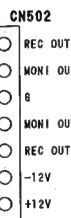
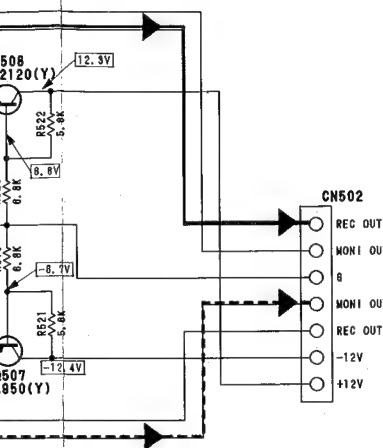
**PCB-4 Power P. C. Board**



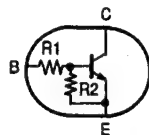
### SCHEMATIC DIAGRAM (2)

**PCB-3** **Dolby B/C NR P. C. Board**

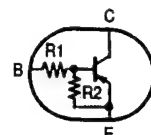




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2



Type	R1(kΩ)	R2(kΩ)
UN4214	10	47

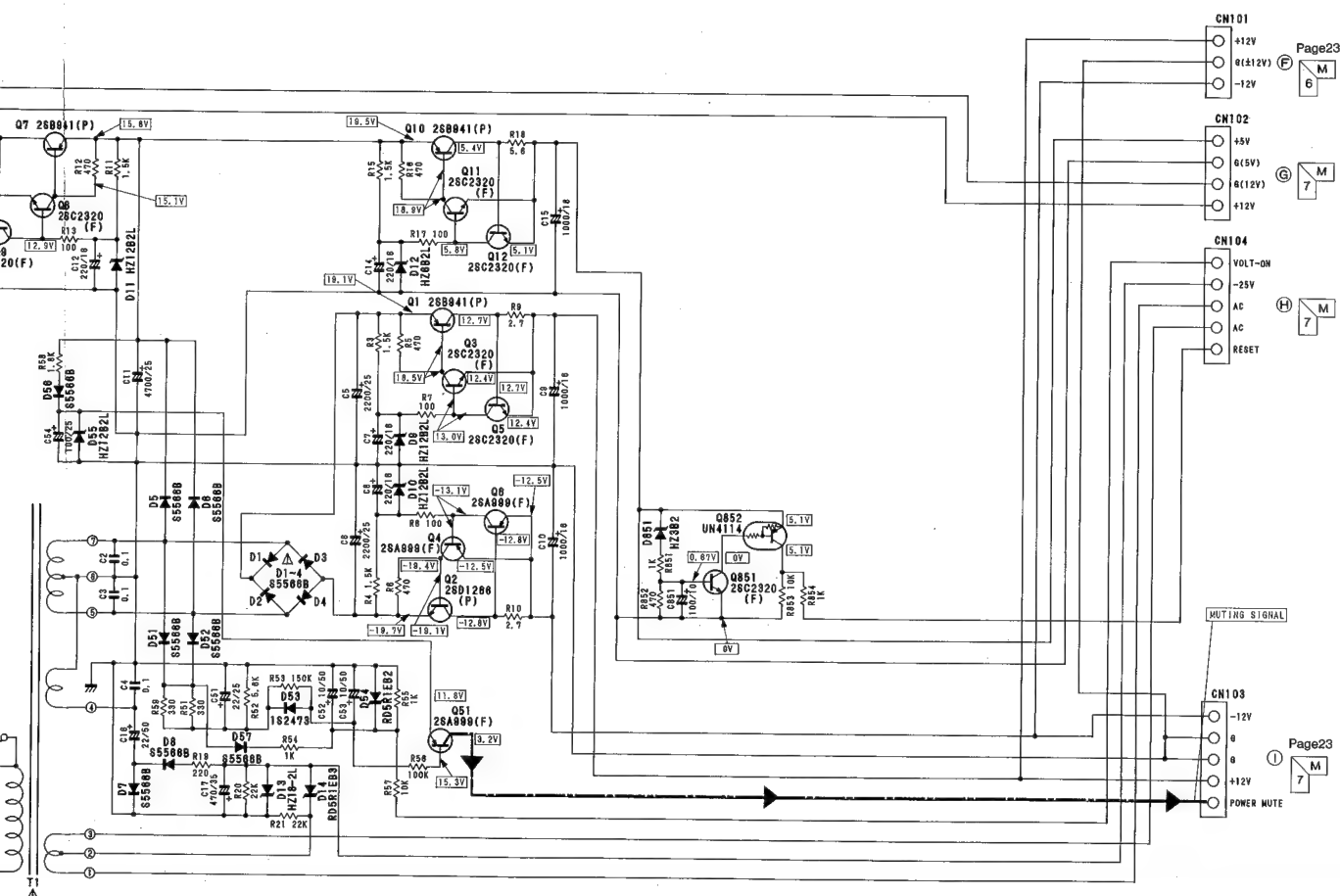


Type	R1(kΩ)	R2(kΩ)
UN4114	10	47
RN2201	4.7	4.7

# NOTE:

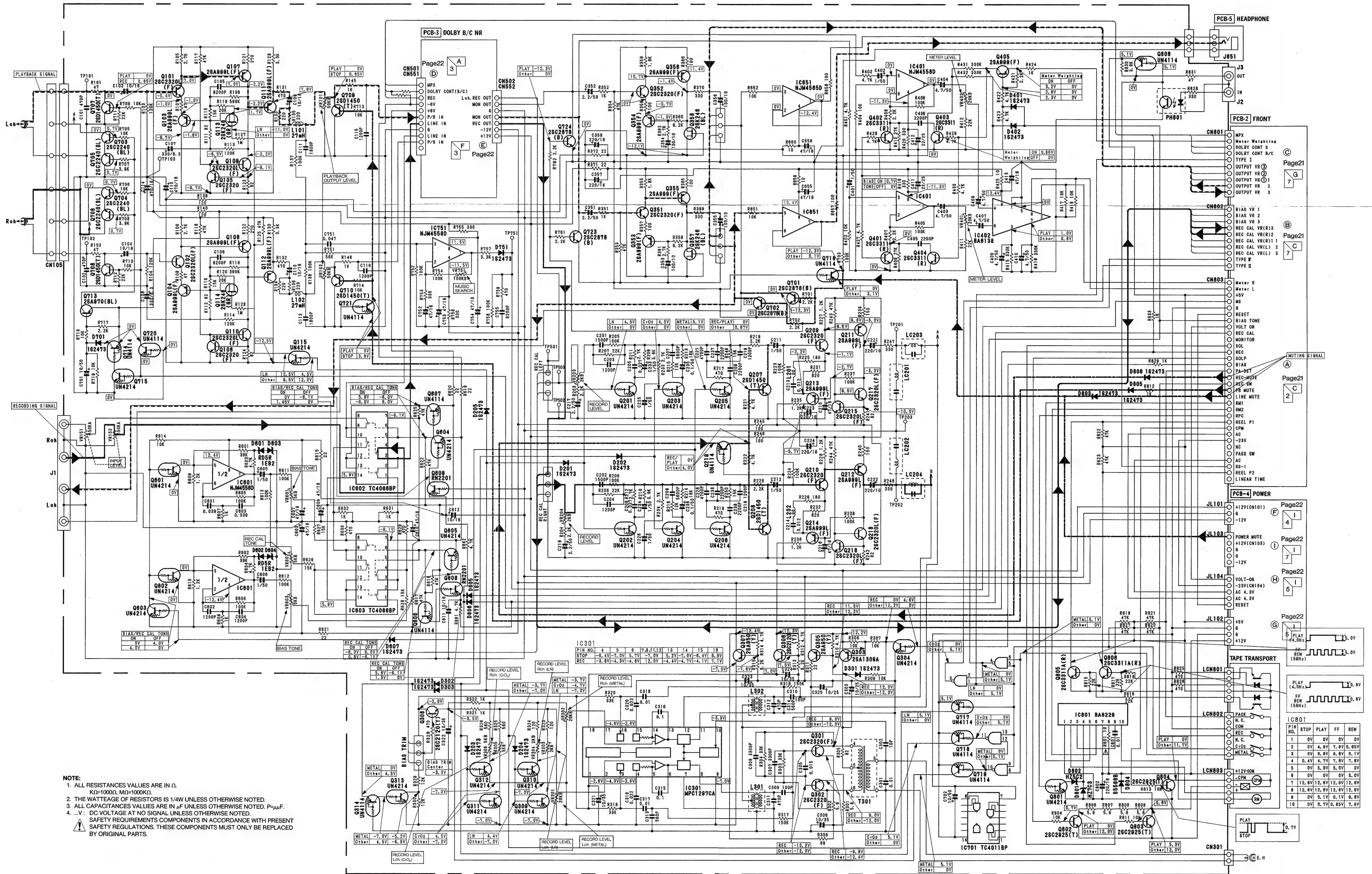
1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
 $K\Omega=1000\Omega$ ,  $M\Omega=1000K\Omega$ .
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUE ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  $P=\mu\mu F$ .
4. ...V : DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

## PCB-4 Power P. C. Board





SCHEMATIC DIAGRAM (3)







ONT (B/C)

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